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VOLUME 81 NUMBER 3

THE ASTROPHYSICAL JOURNAL

AN INTERNATIONAL REVIEW OF SPECTROSCOPY AND ASTRONOMICAL PHYSICS

Founded in 1895 by GEORGE E. HALE *and* JAMES E. KEELER

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THE DEGREE OF VARIABILITY OF CALCIUM CONTENT IN STELLAR ATMOSPHERES

By ERNST ÖPIK

ABSTRACT

Individual fluctuations in the relative abundance of calcium in stars of spectra Fo–G5 are studied on the basis of the deviations of stellar colors from the normal color of the spectral type and absolute magnitude, and are found to be equal to, or less than, ±27 per cent for giants, and ±19 per cent for dwarfs (probable deviations).

No positive evidence for a *systematic difference in calcium content* between giants and dwarfs can be found at present.

The *dependence of color upon absolute magnitude* for stars later than Fo is probably due to a general "pressure effect" similar to the Stark effect, influencing the width of the spectral criterion *Ca* 4227; the disappearance of the color effect at about Fo and its gradual increase with advancing spectrum are easily explained in this way, qualitatively at least. The ordinarily accepted interpretation, consisting of the assumption of equality of an effective level of excitation for constant spectrum, is untenable, since it does not take into account the spectral criteria actually used by observers.

The importance of a knowledge of the relative abundance of the elements in stellar atmospheres was first pointed out by H. H. Plaskett.[1] The pioneer work of Miss Payne[2] led to the recognition of a general resemblance in the composition of stellar atmospheres, of the earth's crust, and of meteorites. Her results, which were later substantiated by Russell,[3] seem to point to a general cosmic law of frequency of the different atomic nuclei. For very different classes of cosmic bodies, such as those mentioned above, physical factors of

[1] *Pub. Dominion Ap. Obs.*, **1**, 372, 1923.

[2] *Stellar Atmospheres*, p. 177, 1925.

[3] *Ap. J.*, **70**, 11, 1929; *Mt. W. Contr.*, No. 383.

selection may have produced a considerable variety in composition even if the original mixture was uniform, and therefore in comparing these different bodies only a rough similarity in composition may be expected; a disagreement amounting to a ratio of 10:1 would not be excessive in such a case.

On the other hand, stellar atmospheres seem to exhibit a similarity of composition much closer than that. In spite of some well-known facts pointing, beyond doubt, toward variety in composition—such as the existence of separate spectral branches among late-type stars or the existence of the peculiar Si^+ and Sr^+ A-type stars[4]—the majority of stars, at least those of similar spectrum and surface gravity, seem to possess a rather striking similarity of composition. Without such a similarity the determination of accurate spectroscopic absolute magnitudes would have been impossible. The question is: How close is this similarity? In the following an attempt is made to evaluate numerically the possible spread of abundance of calcium for Fo–G5 stars of similar spectrum and absolute magnitude.

Our method is purely differential. In such a case the model of an imaginary uniform atmosphere, of a certain constant effective pressure and temperature, works surprisingly well, as has been pointed out by Milne, Russell, and others. We accept this model with the assurance that no serious danger to our conclusions is introduced by it.

As criterion of abundance we use the intensity of *Ca* 4227. Our formulae will be adapted to this special case.

The more or less usual notations are: I = ionization potential; x = degree of ionization of calcium; X = mean ionization of atmosphere; P = electronic pressure; p = total gas pressure; T = effective temperature; a = relative abundance of calcium, or ratio of mass of calcium to mass of all elements; k = effective mass coefficient of general absorption; m = mass of atmosphere above 1 cm² of photosphere; n = number, per cm², of *Ca* atoms absorbing the line 4227; g = surface gravity.

Taking into account $1-x \infty (n/am)$ and neglecting the member containing the partition functions, which in the case of calcium is

[4] Payne, *op. cit.*, p. 169.

very small,[5] the combination of the Saha formulae for two particular stars (to which the subindices 1 and 2 refer) leads to the following differential formula:

$$\log \frac{x_1 a_1 m_1 P_1}{x_2 a_2 m_2 P_2} = -5040 I\left(\frac{1}{T_1}-\frac{1}{T_2}\right)+\tfrac{5}{2}\log\frac{T_1}{T_2}+\log\frac{n_1}{n_2}\,. \tag{1}$$

For the mass coefficient of absorption we assume the general expression

$$k = pF\,, \tag{2}$$

where F depends upon temperature, mean ionization, and composition. Combining with (1) and (2) the well-known relations $P = (X/[1+X])p$, and $m = 1/k$, we get an expression for the ratio of relative abundance of Ca in two stars

$$\log \frac{a_1}{a_2} = -5040 I\left(\frac{1}{T_1}-\frac{1}{T_2}\right)+\tfrac{5}{2}\log\frac{T_1}{T_2}+\log\frac{n_1}{n_2}-Q\,, \tag{3}$$

where

$$Q = \log \frac{x_1 X_1 (1+X_2) F_2}{x_2 X_2 (1+X_1) F_1}\,. \tag{4}$$

For stars of the same spectrum,[6] practically $x_1 = x_2 = 1$ and $X_1 = X_2$, and Q depends chiefly upon F. Further, the ionization being constant, F depends only upon temperature and composition. We set

$$F = \beta T^{-\alpha}\,, \tag{5}$$

where β depends upon chemical composition.

Existing determinations of color indices are much more numerous and more accurate than spectrophotometric (visual) determinations of stellar temperatures; therefore we shall use the latter only for purposes of calibration, whereas for individual application we shall rely upon color indices.

A general catalogue of color indices reduced to a certain uniform

[5] H. N. Russell, *Ap. J.*, **75**, 337, 1932; *Mt. W. Contr.*, No. 447.

[6] *Ibid.*, Table VII.

scale has been published by the writer.[7] The color indices, C, of this catalogue represent weighted and standardized values derived from different sources; the scale differs from the usual in adopting as visual magnitude the direct mean of Harvard and Potsdam. From different tests it appeared that a fair degree of homogeneity is actually attained in this catalogue. These color indices, plotted against Wilsing's spectrophotometric temperatures,[8] exhibited an excellent linear correlation,

$$\frac{c_2}{T}=1.47C+1.82\,, \tag{6}$$

with a probable deviation of ± 0.22 in c_2/T, or ± 0.15 mag. in color index, which is almost exactly equal to the probable error derived from the internal agreement of Wilsing's observations. The probable error of the color indices is only ± 0.04 in c_2/T units. Thus, the color indices possess an individual weight about thirty times greater than that of Wilsing's spectrophotometric observations.

Formula (6) gives us a means to express (3) in terms of relative colors, instead of in relative temperatures. Assuming the Kramers' value $\alpha=9/2$ (with ± 1 as a reasonable estimate of the probable error),[9] and replacing $\log T_1/T_2$ by its first-order differential expression, with $c_2=14{,}300$ and $I=6.09$, we get from (3), (4), (5), and (6) the following working formula:

$$\log\frac{a_1}{a_2}=-3.15\,(C_1-C_2)+\frac{0.87\,(C_1-C_2)}{\overline{C}+1.24}+q\,, \tag{7}$$

where $\overline{C}=(C_1+C_2)/2$ and,

$$q=\log\frac{n_1}{n_2}+\log\frac{\beta_1}{\beta_2}-\log\frac{x_1X_1(1+X_2)}{x_2X_2(1+X_1)}\,. \tag{8}$$

For two stars of approximately equal surface gravity, equal intensity of *Ca* 4227, and similar composition, q is close to zero; for $a_1=a_2$,

[7] *Pub. Tartu Obs.*, **27**, Part I, 1929. [8] *Pub. Potsdam Ap. Obs.*, **76**, 1919.

[9] Quite different processes of radiation lead to closely similar values of β; e.g., for radiation produced by atomic collisions the writer finds $\alpha=3.7$ from partly empirical, partly theoretical, considerations (*Acta et commentationes Univ. Tartu*, A, **26**, Part 2, p. 38, 1933; *Harvard Reprint*, No. 100).

$C_1 = C_2$ follows in this case. The colors must be identical when the *Ca* abundance is the same; and, vice versa, any variation of calcium content in similar stars of equal intensity of *Ca* 4227 must be revealed by a spread in the colors of these stars.

When we compare stars of widely different surface gravity, a certain difficulty in applying formula (7) arises. Equal intensity (total absorption) of a spectral line means an equal number of atoms, either when the pressures are equal or when the line just appears (small monochromatic optical depth at the center of the line). If these conditions are not fulfilled, a certain "pressure effect"[10] enters, such that for the same number of absorbing atoms a greater pressure produces a broader and stronger line. Or, when the lines are equal in intensity, n_1 is not equal to n_2; a smaller number of absorbing atoms is required at a higher pressure. Unless this "pressure effect" is exactly known, it is impossible to draw any conclusions concerning the relative abundance of calcium in giants and dwarfs.

For stars of spectrum Fo and later the spectral type is practically determined by the intensity of *Ca* 4227, and vice versa; this, at least, holds for the highly accurate Victoria classification,[11] and evidently for the Mount Wilson classification also because the latter is practically identical with the Victoria classification. In our catalogue of color indices the combined Mount Wilson–Victoria spectrum estimates are given, and for the Fo–G5 stars considered here we assume the spectral class to be synonymous with the absolute intensity of *Ca* 4227; equal spectrum means equal intensity of λ 4227. For stars earlier than F9 actually the ratio λ 4227 : $H\gamma$ was used for the determination of the spectrum; but as λ 4227 is weak in this case, the relative intensity may be regarded as defining the absolute intensity closely enough.

In the first place, we shall consider the well-known color absolute-magnitude effect which establishes itself in spectra later than Fo. The commonly accepted explanation[12] of the effect, assuming

[10] A. S. Eddington, *Der innere Aufbau der Sterne* (Berlin, 1928), p. 441. The definition "pressure effect" is not accurate; for the same pressure the effect may be different in the laboratory and in the stars.

[11] Young and Harper, *Pub. Dominion Ap. Obs.*, **3**, 14, 1924.

[12] Eddington, *op. cit.*, p. 451; also B. Sticker, *Zs. f. Phys.*, **61**, 557, 1930.

that equal spectral type means equal level of excitation (equality of $x/(1-x)$ for a certain effective ionization potential) cannot be regarded as satisfactory:[13] the absence of the effect in earlier spectra remains unexplained, as does also the actual gradual change of the effect with the progression of spectral type; also, the mean level of excitation is not a directly observable quantity. Actually, in an accurate spectral classification, like the Victoria system, spectral type depends upon the intensity of one definite spectral line, or upon the ratio of two lines (even in the less homogeneous Harvard classification the assumption of mean excitation level as spectral criterion is not justified). The color effect should be examined directly from this observational standpoint, as has been done already in formula (7).

Let us first assume identical composition ($a_1=a_2$ and $\beta_1=\beta_2$) and absence of the "pressure effect" or $n_1=n_2$, for a giant and a dwarf of equal spectrum; with nearly equal mean ionization we have $q=0$ and $C_1=C_2$. The color effect should be zero in such a case. In spectrum Fo, λ 4227 is weak and consequently the "pressure effect" must be small; thus the condition $n_1=n_2$ must be approximately fulfilled. The actual absence of the color effect in class Fo apparently indicates, according to (7), the identity of the mean calcium content ($a_1=a_2$) (with approximate equality of β_1 and β_2) of Fo giants and dwarfs.

For later spectra, observations indicate $C_g>C_d$. Assuming, by analogy with Fo, identical composition, we get $n_g>n_d$; at the lower pressure in a giant a greater number of absorbing atoms is required to produce a line of the same intensity as in a dwarf. This conclusion is in harmony with the general character of the "pressure effect."

On the other hand, systematic differences in composition may also aid in producing the color absolute-magnitude effect. According to (7), a smaller relative abundance of calcium (larger amount of hydrogen?) would give an effect in the required direction (complications from β depending upon mean composition enter in this case). But unless the "pressure effect" of *Ca* 4227 in stellar conditions is accurately known and is shown to be insufficient, no definite conclu-

[13] For x near 1, we may have practically equal degree of ionization, and at the same time widely different values of $x/(1-x)$ in the Saha formula.

sions with respect to systematic differences in the composition of giants and dwarfs can be made.

With average colors of giants and dwarfs, as derived by the writer,[14] and with typical data based on the average absolute magnitudes and Eddington's mass-luminosity relation, tentative values of the "pressure effect," $n_g : n_d$, were computed from (7) by assuming $a_1 = a_2$, $\beta_1 = \beta_2$, $x_1 = x_2 (= 1)$, for two cases: (1) $X_1 = X_2$ and (2) X_1 and X_2, taken according to Russell.[15] Table I contains a summary of the computations.

TABLE I

HYPOTHETICAL "PRESSURE" EFFECT IN GIANTS AND DWARFS

SPECTRUM	C_g	C_d	ABS. MAG.		$p_d : p_g$	$n_g : n_d$	
			g	d		(1)	(2)
F0–F3 (F1.5)	0.27	0.25	0.0	3.0	2.8	1.15	1.41
F4–F6 (F5)	.39	.30	0.0	3.5	4.5	1.74	1.90
F7–G1 (F9)	.69	.44	−1.0	4.0	11.1	4.5	4.1
G2–G5 (G3.5)	0.87	0.43	0.0	5.0	22.8	15.5	13.2

The ratio of pressures is computed from

$$\frac{p_1}{p_2} = \left(\frac{g_1}{g_2}\right)^{\frac{1}{2}} \left(\frac{T_1}{T_2}\right)^{\frac{9}{4}} . \qquad (9)^{16}$$

In the table the ratio $n_g : n_d$ increases very rapidly with advancing spectral type, because of the simultaneous increase of the pressure ratio and the monochromatic optical depth of *Ca* 4227. The uncertainty regarding mean ionization has little influence on the results, as may be seen from a comparison of cases (1) and (2) of Table I.

In the case of Stark effect, it is easy to show that for any law of interaction depending upon the distance, equal intensity of the wings of a line (defined as equal optical depth at equal width) is attained when $p_1/p_2 = n_2/n_1$; and equal total intensity is attained when

$$1 \leqslant \frac{n_2}{n_1} \leqslant \frac{p_1}{p_2} \qquad (\text{for } p_1 > p_2) .$$

[14] *Op. cit.*, p. 49.

[15] *Op. cit.*, Table VI.

[16] Eddington, *op. cit.*, p. 451; this also follows directly from our assumptions.

The data of Table I conform very well to this condition.

Independently of a possible systematic change of composition with absolute magnitude, the individual fluctuations of the relative abundance of calcium may be studied in the following purely differential way: Let the normal (or average) color of stars of a given spectrum and absolute magnitude be C_0. In formula (7) we compare an individual star with the average star, $C_1=C$ and $C_2=C_0$. With a much closer degree of approximation than in the comparison of stars of different luminosity, we may assume $q=0$. Thus we get the apparent deviation of calcium abundance as

$$\log a-\log a_0=\left(-3.15+\frac{0.87}{C_0+1.24}\right)(C-C_0)\,. \tag{10}$$

This quantity may be partly real and partly due to observational errors. Because of the smallness of the actual deviations it is impossible in individual cases to establish the reality of a deviation, and the problem must be treated statistically.

Let the standard deviation of $C-C_0$ be Δ, and the purely observational error in $C-C_0$ be Δ_1; the true spread in colors is then

$$\Delta_2=\pm\sqrt{\Delta^2-\Delta_1^2}\,. \tag{11}$$

Substituting Δ_2 for $C-C_0$ in (10), we get a maximum value for the logarithmic spread of the calcium abundance. The true spread must be smaller because a real spread in the observed stellar colors may be produced by causes other than fluctuations of calcium abundance, namely, (*a*) by photometrically unresolved double stars of unequal color; (*b*) by companions (even of the same color) resolved visually but unresolved photographically (negative deviations in color); (*c*) by selective absorption of light in space (positive deviations).

In the computations all stars suspicious from the standpoint of (*a*) and (*b*) were excluded, such as composite spectra, etc.; however, disturbing influences from these sources cannot be prevented altogether. As to absorption of light in space, the expected asymmetry in the distribution of large deviations was not found, the distribution of $C-C_0$ being equally symmetrical for giants and for dwarfs. The influence of this source is apparently weak in our present material.

In assigning the normal colors a linear relation of color to spectro-

scopic absolute magnitude was assumed. By introducing a linear correlation instead of the true one[17] we evidently increase the spread of $C-C_0$ and get a larger value of the variation of abundance, hence a departure in the same sense as produced by other causes mentioned above.

The color-luminosity relation actually adopted on the basis of the writer's data[18] is represented in Table II (abbreviated).

TABLE II

RELATION OF MEAN COLOR AND ABSOLUTE MAGNITUDE

	Spectrum.....	Fo	F3	F5	F7	F9	G1	G3	G5
C_0	$M=0.0$.....	0.17	0.30	0.39	0.52	0.64	0.71	0.86	0.91
C_0	$M=3.0$.....	0.17	0.27	0.31	.41	.49	.53	.59	.64
C_0	$M=5.0$.....	.....	.....	.....	0.35	0.39	0.41	0.42	0.46

The observational error in $C-C_0$ was computed from

$$\Delta_1=\pm\sqrt{\Delta_p^2+\Delta_s^2+\Delta_m^2}\,, \qquad (12)$$

where Δ_p is the photometric error in C, Δ_s the error in C_0 due to error in spectral class (assuming the standard error in spectrum $=\pm 0.05$ sp. class), Δ_m the error in C_0 due to the error in absolute magnitude (assuming the standard error in M_{sp} equal to ± 0.6 mag.).

For the separate spectral subdivisions as given in Table I, the logarithmic dispersion of calcium abundance was computed separately for giants and dwarfs. No distinct influence of spectral type could be traced, but the giants seemed to show a somewhat larger dispersion than the dwarfs. Among the 234 stars with accurate spectra, absolute magnitudes, and colors, there were only three outstandingly large deviations (corresponding to about a tenfold discrepancy in *Ca* abundance): one giant with $C-C_0=+0.35$, sp. F2 (HD, G_5), mag. 5.8, Göttingen Aktin. No. 124, possibly influenced by selective absorption; and two dwarfs (Göttingen Aktin. Nos. 606 and 3175), with $C-C_0=-0.32$ and -0.35, respectively, sp. F9 and F4, mag. 6.7 and 7.6, which may be influenced by nearby companions. Using Potsdam visual magnitudes only, the residuals for these two stars are smaller, -0.13 and -0.22, respectively. Rejecting all three ex-

[17] Sticker, *op. cit.* [18] *Op. cit.*

ceptional cases, the rest of the data gave the following weighted mean values: for 75 giants, $\Delta = \pm 0.093$ mag., $\Delta_1 = \pm 0.067$ mag., $\Delta_2 = \pm 0.064$ mag.; for 156 dwarfs, $\Delta = \pm 0.079$ mag., $\Delta_1 = \pm 0.064$ mag., $\Delta_2 = \pm 0.047$ mag.

From these values of Δ_2 we find the following values of the accidental individual fluctuations of the relative abundance of calcium: ± 27 per cent (p.e.) in giants of sp. Fo–G5, with a probable error of ± 3.0 per cent; ± 19 per cent (p.e.) in dwarfs of same spectral range, with a probable error of ± 2.3 per cent.

Considering the fact that for reasons explained above these percentages are likely to be exaggerated, we conclude that the individual spread of calcium abundance in stellar atmospheres is rather small. It appears probable that our conclusion holds also for all the rest of the elements. Further study of this problem on the basis of special data may lead to results of deep cosmogonical consequence.

TARTU, ESTONIA
July 1934

NOTE: THE FLUCTUATIONS IN CALCIUM ABUNDANCE IN F7–G1 DWARFS

BY ERNST ÖPIK AND JOHN W. ABRAMS

In the preceding paper the normal color, C_0, of a star is determined by the spectroscopic absolute magnitude. Since the latter is based on line intensities and spectral type, both of which are influenced by abundance phenomena, the danger exists that the results are systematically influenced by Δ_m (see formula [12]). Owing to the smallness of Δ_m, the danger does not seem to be serious; nevertheless it appeared advisable to test the methods and formulae of the preceding paper by using as a basis trigonometric, instead of spectroscopic, parallaxes. Unfortunately, only dwarf stars have parallaxes of an individual relative accuracy sufficient for our purpose. A selected list of eighteen F7–G1 stars with trigonometric parallaxes exceeding more than five times their probable errors was compiled. We are greatly indebted to Professor Frank Schlesinger for supplying us with up-to-date parallax data. The average probable error of a trigonometric absolute magnitude was ± 0.20. In the notations of the preceding paper we found $\Delta = \pm 0.051$ mag., $\Delta_1 = \pm 0.038$ mag., and a probable deviation in calcium abundance of ± 14 per cent.

The same list of stars treated with the spectroscopic absolute magnitudes as a basis gave $\Delta = \pm 0.052$ mag., $\Delta_1 = \pm 0.046$ mag., and a probable deviation in calcium abundance of ± 10 per cent. The results of both methods are in satisfactory agreement and confirm the conclusions of the preceding paper regarding the smallness of the fluctuations in the relative abundance of calcium.

July 1934

THE SPECTROSCOPIC ABSOLUTE MAGNITUDES AND PARALLAXES OF 4179 STARS*

By WALTER S. ADAMS, ALFRED H. JOY, MILTON L. HUMASON, and ADA MARGARET BRAYTON

ABSTRACT

The methods described in previous publications have been used for determining stellar absolute magnitudes by the spectroscopic method. A larger number of lines has been used (Table I) and the reduction-curves have been revised. The catalogue gives the spectral type, absolute magnitude, and parallax determined for 4179 stars mostly of types later than A5 and north of declination $-26°$.

The determination of the absolute magnitudes of stars from their spectra has been continued as a major program of research since the method was first developed here and reduced to a practical basis in 1916. For the stars of types later than A5 at least, the method has proved eminently satisfactory. It is equally applicable to dwarfs and giants, as far as the absolute magnitudes are concerned. In the parallaxes derived from the absolute magnitudes, the uncertainties depend upon the size of the parallax.

As originally conceived, the relationship of spectral line intensity to absolute magnitude was essentially an empirical one. While later researches of Saha and others have furnished a definite physical basis for the method, which fully establishes its theoretical soundness, it has seemed wiser for practical purposes to continue the work along the simple lines already described in *Mount Wilson Contributions* Nos. 142 (1917), 199 (1921), and 319 (1926). The process is, in brief: From a group of spectrograms of stars of the same spectral type and differing absolute magnitudes (determined from other sources), spectral lines are chosen which change in intensity with the absolute magnitude; the intensity of each variable line relative to a neighboring line of nearly fixed intensity is estimated in steps; then, empirical calibrating curves are drawn connecting the intensity differences with absolute magnitude. The process is repeated in turn for each spectral type. For convenience, tables prepared from

* *Contributions from the Mount Wilson Observatory, Carnegie Institution of Washington*, No. 511.

the curves are used in practice to convert line-intensity differences into absolute magnitudes. The total intensity of the line is estimated, rather than the width or the depth. Since the appearance of the lines varies somewhat on different spectrograms and in different stars, the observer, at times, in dealing with a particular line, must base his judgment upon his experience. Because some of the lines used are blends, the reduction-curves are applicable only to spectrograms within a moderate range of dispersion and resolving power.

LINES USED FOR REDUCTION-CURVES

Several pairs of lines have been introduced into our recent estimates of absolute magnitudes in addition to those of earlier lists. The same group of lines was used by each of the observers, but separate reduction tables were prepared. The lines and the spectral types for which they have proved satisfactory for absolute-magnitude estimates are given in Table I. The lines of the ionized atoms

TABLE I

LINES USED FOR ABSOLUTE MAGNITUDE

Line	Comparison Line	Origin	A	F	dG	dK	dM	ggG	ggK	gG	gK	gM
λ 4077....	λ 4071	*Sr* II	*	*	*	*		*	*	*	*	*
4161....	4167	*Ti* II	*	*	*			*	*	*		
4196....	4199	*Fe* I			*	*				*	*	
4207....	4202	*Fe* I										*
4215....	4250	*Sr* II	*	*	*	*				*	*	
4233....	4236	*Fe* II	*	*				*	*	*	*	
4246....	4250	*Sc* II	*	*	*			*	*	*		
4258....	4260	*Fe* I, *Fe* II			*	*						*
4290....	4271	*Cr* I, *Ti* II	*	*				*	*	*		
4318....	4321	*Ca* I			*	*	*					
4324....	4321	*Cr* I et al.		*	*			*	*	*	*	
4340....	4325	*Hγ*									*	*
4375....	4404	*Sc* II, *Y* II	*	*				*	*	*		
4379....	4376	*V* I				*	*					
4399....	4404	*Ti* II	*	*	*			*	*	*		
4408....	4415	*Fe* I, *Ti* II			*	*				*	*	
4435....	4415	*Ca* I				*	*					
4454....	4461	*Ca* I		*	*	*	*					
4489....	4494	*Fe* I, *Fe* II									*	*
4535....	4415	*Ti* I				*	*					
4586....	4572	*Ca* I					*					
4607....	4603	*Sr* I					*					
4861....	4871	*Hβ*									*	*

become stronger as the absolute magnitude increases, while the lines of neutral atoms usually diminish in intensity. The comparison lines, in general, are the iron-arc lines of intermediate temperature class which vary little with absolute magnitude. In giant stars of late K and M types certain low-temperature lines of iron are notably affected by absolute magnitude and form valuable criteria for such stars.

BASIS OF ABSOLUTE-MAGNITUDE VALUES

The absolute-magnitude values given herewith are based upon the reduction tables which were used in our previous lists; but, in view of the considerable increase in the number of trigonometric parallaxes in recent years, it has seemed advisable, especially for the dwarfs, to try to bring the spectroscopic system into general agreement with the existing trigonometric system. This has been accomplished by applying minor corrections to the values given by the reduction tables so that the mean results correspond to the mean trigonometric values now available. For the giant stars the principal basis has been mean absolute magnitudes derived from proper and peculiar motions, with some slight modifications suggested by the trigonometric results. When Dr. Schlesinger's revised catalogue of parallaxes is published, it will be possible to make a more complete comparison with all the trigonometric parallaxes reduced to a uniform system. The outstanding differences will doubtless be small.

Most of the stars in our previous lists are included in the present catalogue. Their absolute magnitudes have been entirely redetermined with the aid of the revised reduction tables and a larger number of lines than was used previously. The Cepheid variables have been reserved for special study. The values previously given for Boss 4211, C 935, and Lalande 34958 were apparently based on plates wrongly identified. Comparison of the new absolute magnitudes with those of the "1646" and "410" lists[1] is given in Tables II and III, where the differences are taken algebraically, new *minus* old. A positive value thus indicates that the new magnitudes are fainter than the old. The greatest differences are among the giants,

[1] *Mt. W. Contr.*, No. 199; *Ap. J.*, **53**, 13, 1921; *Mt. W. Contr.*, No. 319; *Ap. J.*, **64**, 225, 1926.

which are considerably brighter in the later types according to the revised estimates. For 63 supergiants the new values are 0.49 mag. brighter than in the 1646 list, and for 31 faint giants the mean difference is +0.17 mag.

TABLE II

COMPARISON WITH 1646 LIST

Type	Main Sequence		Giants	
	No.	Diff.	No.	Diff.
		mag.		mag.
A2–3	2	−0.6	.....	.....
A4–5	8	+ .1	.....	.....
A6–7	15	.0	.....	.....
A8–9	15	+ .3	.....	.....
F0–1	39	+ .8	.....	.....
F2–3	72	+ .3	.....	.....
F4–5	94	+ .1	.....	.....
F6–7	64	− .1	.....	.....
F8–9	55	− .1	1	+1.7
G0–1	52	− .3	11	+0.6
G2–3	49	− .4	12	+ .9
G4–5	37	− .3	54	+ .4
G6–7	42	− .2	92	.0
G8–9	26	− .3	74	− .6
K0–1	50	− .1	104	− .7
K2–3	20	− .1	110	− .6
K4–5	43	− .1	131	− .6
K6	26	− .2	.....	.....
M0–1	31	− .1	62	− .6
M2–3	12	.0	71	− .6
M4–5	2	+0.3	29	−0.5
Total	754	−0.04	751	−0.36

SPECIAL GROUPS

As heretofore, the extremely luminous stars, which have been called "supergiants" or "pseudo-Cepheids," have been reduced by special tables computed with the aid of their parallactic motions.

The existence of a group of stars of types G and K somewhat fainter than normal giants has been indicated by the statistical studies of Strömberg.[2] Although these stars may not be entirely

[2] *Mt. W. Contr.*, No. 442; *Ap. J.*, **75**, 120, 1932.

separated from the giants in absolute magnitude, there is some spectroscopic evidence in support of the suggestion. About 90 such stars were selected on the basis of the intensities of the lines λλ 4077, 4215, 4324, and 4454. Special reduction-curves, based on trigonometric parallaxes, were used to determine the spectroscopic absolute magnitudes of these stars.

Reference[3] has previously been made to 3 stars of large proper motion, which, in absolute magnitude, seem to form a group midway

TABLE III

COMPARISON WITH 410 LIST OF M STARS

Type	Dwarfs		Giants	
	No.	Diff.	No.	Diff.
		mag.		mag.
Mo	34	0.0	72	−0.1
M1	26	+ .1	50	.2
M2	15	.0	68	.2
M3	12	+ .2	53	.2
M4	4	+ .1	36	.2
M5	6	−0.1	20	.1
M6	.....	.....	10	.1
M7	.....	.....	1	−0.2
Total	97	+0.05	310	−0.16

between the faint "white dwarfs," such as the companion to Sirius, and the stars of early type belonging to the main sequence. Three other stars have been added to the group, and the absolute magnitudes have been estimated by using the lines λλ 4215, 4290, 4375, 4454, and 4481. All 6 have trigonometric parallaxes. There can be no doubt but that the absolute magnitudes are of the right order. Data for the individual stars are given in Table IV. Their spectra, in many respects, resemble those of Sirius B and *o* Eridani B. The hydrogen lines are narrow and sharp, the metallic lines faint, and λ 4233 and λ 4481 are hardly visible.

PROBABLE ERRORS

From a comparison with trigonometric parallaxes, the probable error of the absolute magnitudes in the list of 1646 stars was com-

[3] Adams and Joy, *Mt. W. Contr.*, No. 244; *Ap. J.*, **56**, 262, 1922.

puted to be about 0.4 mag., or 20 per cent of the parallaxes themselves. The errors of the present list should be somewhat less because more lines have been used in the estimates for spectroscopic absolute magnitude. Quantitative estimates will be made later when Schlesinger's revised system of trigonometric parallaxes is available.

In the meantime, a convenient check on the internal probable errors of the absolute-magnitude determinations and the systematic agreement of the reduction-curves of different spectral types may be obtained by comparing the absolute magnitudes of the components of double stars and the members of moving clusters. The

TABLE IV

INTERMEDIATE "WHITE DWARFS"

Star	m	Sp.	μ	M
HD 19445	8.0	A4	0".86	5.0
HD 84937	8.3	A4	0.83	4.9
20C 825	10.2	A4	0.54	5.0
HD 132475	8.5	A9	0.78	4.7
HD 140283	7.3	A5	1.18	4.9
HD 219617	9.0	A8	1.30	5.0

catalogue includes 157 double stars which seem to be physical systems, 74 Hyades, 31 Praesepe, and 9 Perseus cluster stars. Since the components of physical pairs and of moving clusters are equally distant from the earth, their moduli $(m-M)$ should be equal in each physical system. If the apparent magnitudes were accurately known, the deviations from the mean of the moduli would indicate the accidental errors of the absolute magnitudes. Disregarding the errors in the apparent magnitudes, the probable error of a single determination of absolute magnitude for 429 stars is 0.27 mag.

The mean systematic differences, taken in the same way, by spectral types (main sequence) are:

A	91 stars	+0.02 mag.
F	142	− .01
G	101	− .01
K	69	− .03
M	26	+0.06

These differences indicate that the internal systematic errors between the different reduction-curves for different spectral types of the main sequence are negligible.

SELECTION OF STARS

The catalogue comprises, for the most part, stars of spectral classes F, G, K, and M, but a few A-type stars have been included as well. It is essentially complete for the stars later than A and north of declination $-26°$ in Boss's *Preliminary General Catalogue*. The catalogue also contains about 250 stars from the Selected Areas, mostly brighter than the eighth magnitude, and a number of well-known visual double stars. For these three groups there has been no intentional selection with regard to absolute magnitude, distance, or proper motion. For the purpose of comparison many stars have been selected from those which have trigonometric parallaxes. Most of the remaining stars have been selected on account of large proper motion or because they are members of certain groups.

DISTRIBUTION OF ABSOLUTE MAGNITUDES

A Russell diagram (Fig. 1) has been prepared to show the distribution of the absolute magnitudes of the catalogue with respect to spectral type. The diagram is of the usual form, with one dot plotted for each star. The main sequence and the giant series are well defined. The scattering supergiants, the group of faint giants, and the intermediate white dwarfs are suggestive of other sequences. The well-known gap between the giants and dwarfs of types K and M and the lack of F-type stars in the giant series are prominent features of the diagram.

Attention should be called to a slight modification of our system of classification in the region of K5. Among the giants Mo follows K5, but in the dwarfs an intermediate step called K6 is recognized. The giant series, then, runs K5, Mo, M1, etc., while for the dwarfs we have K5, K6, Mo, M1, etc. This procedure seems to be consistent with the view that the temperatures of giants are lower than those of dwarfs of the same spectral class and with the Harvard classification,[4] which recognizes titanium bands as early as K5.

[4] *Harvard Ann.*, **91**, 9, 1918.

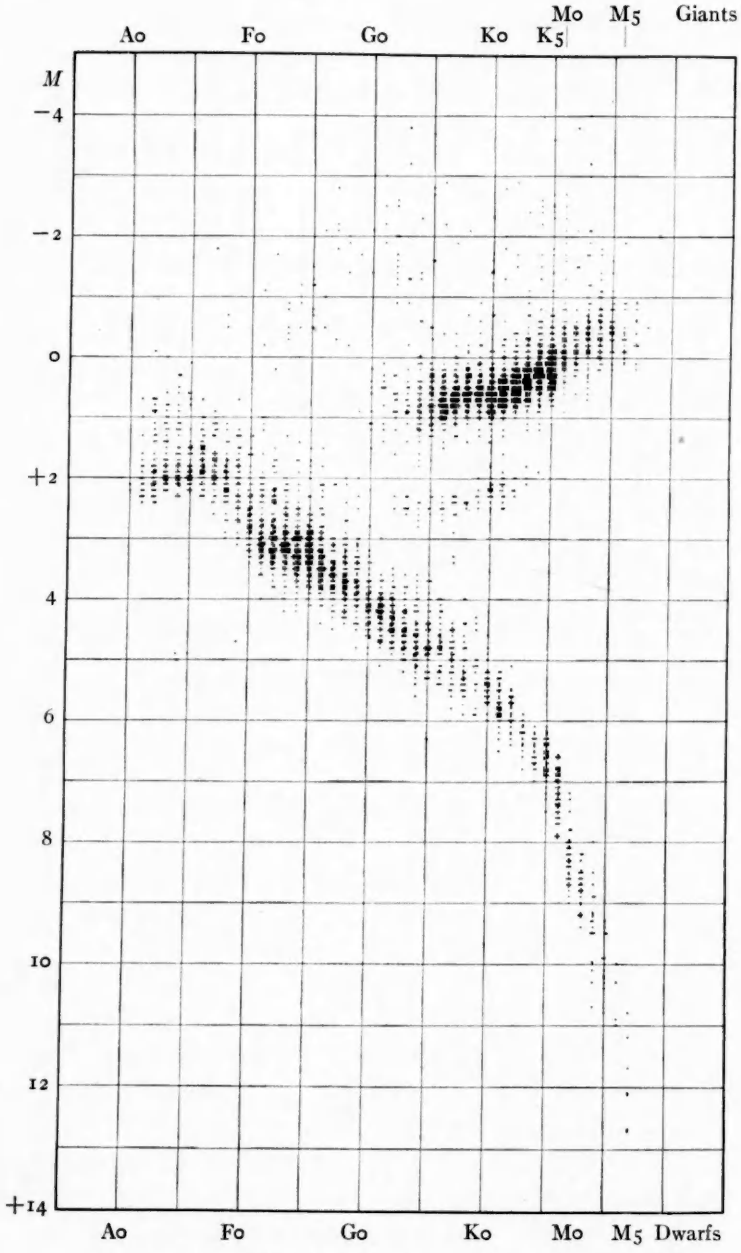

FIG. 1.—Distribution of spectral type and absolute magnitude

The curves of Figure 2 give in condensed form the material of Figure 1. The numbers of stars of certain spectral types are plotted as ordinates with spectral type as abscissae.

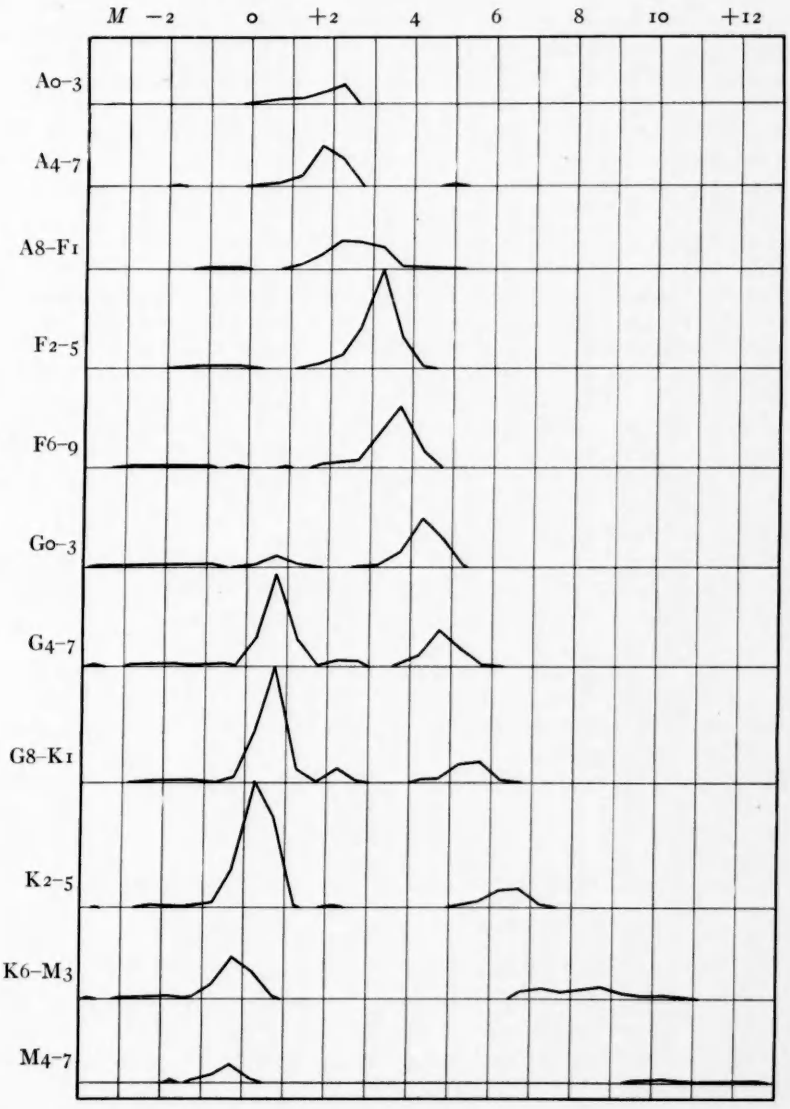

FIG. 2.—Frequencies of absolute magnitudes for different spectrum intervals

THE CATALOGUE

The catalogue gives the spectral type, absolute magnitude, and other relevant data for each of 4179 stars.

Column

1. The number is that of Boss's *Preliminary General Catalogue*, unless otherwise indicated. The abbreviations are: C, *Cincinnati Publications*, No. 18; 20C, *Cincinnati Publications*, No. 20; ADS, Aitken's *Catalogue of Double Stars;* βGC, Burnham's *General Catalogue of Double Stars;* BD, *Bonner Durchmusterung;* CD, *Cordoba Durchmusterung*. The letters A, B, C, etc., following the number refer to the component of a double star as given in ADS or βGC. Letters in parentheses indicate that the components have separate Boss numbers.
2. Number in the *Henry Draper Catalogue* or in the *Extension*.

3 and 4. Right ascension and declination for 1900.

5. Visual magnitude from the *Henry Draper Catalogue*, if found there; otherwise, from the BD with the corrections given in *Harvard Ann.*, **72**, 214. The magnitudes of several faint dwarf stars have been kindly furnished by H. C. Willis from Mount Wilson plates. These values have been reduced from photographic to visual magnitudes by color indices corresponding to the spectral types. We are also greatly indebted to Dr. G. Kuiper of the Lick Observatory for his kindness in allowing us to use in advance of publication a number of his determinations of the visual magnitudes of double stars and faint dwarfs. His results were obtained mostly in Leiden with the aid of an objective grating and a wedge photometer.

   The combined magnitudes of close double stars and spectroscopic binaries have been reduced to that of the brighter component. Magnitudes so corrected are marked †. The difference in magnitude given in ADS or βGC has been preserved by adjusting the value for the fainter component.
6. The Mount Wilson spectral type, determined by direct comparison with the spectra of standard stars chosen to accord with the Harvard system and the criteria adopted by the International Astronomical Union.
7. The total proper motion, usually taken from Boss's *P.G.C.*, *Cincinnati Publications*, or Schorr's lists. Other values have been collected from various sources.
8. The spectroscopic visual absolute magnitude from the estimates of Adams, Joy, and Humason.
9. The absolute parallax resulting from the apparent and absolute magnitudes given in the catalogue.

The significance of the symbols occurring in the catalogue is as follows:

* See note at end of the table.

† Magnitude corrected to the brighter component of the double star or spectroscopic binary.

‡ Composite. The spectrum is veiled by that of its companion.

‖ The spectrum has double lines.

CATALOGUE OF SPECTROSCOPIC PARALLAXES

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
1.....	28	$0^h\ 0^m2$	− 6°16′	5.0†	Ko	0″.09	2.1	0″.026
ADS 48B....	.....	0 0.4	+45 16	9.0†	Mo	.86	8.5	.079
2.....	87	0 0.6	+12 50	6.0†	G4	.04	0.8	.009
3A....	123	0 1.0	+57 53	6.4†	G3	.27	4.5	.042
3B....	.....	0 1.0	+57 53	7.5	G8	.27	5.3	.036
CD −33°16843.....	151	0 1.2	−33 22	8.5	M4e*	.02	−0.5	.002
6.....	166	0 1.4	+28 28	6.2	G8	.42	5.5	.072
BD +72° 1140.....	219	0 1.9	+72 39	8.0	A5n	.03	1.8	.006
7.....	315	0 2.6	− 3 6	6.3	Aon	.03	2.2	.015
9.....	352	0 3.1	− 3 0	6.6†	K2	.01	0.2	.005
12A....	432	0 3.8	+58 36	2.7†	F2	.56	2.2	.079
13.....	448	0 3.9	+17 39	5.7	G9	.14	0.5	.009
C 9.....	443	0 4.0	+64 31	7.0	G9	.30	5.0	.040
BD +61° 8.....	.....	0 4.4	+62 6	9.5	M2ep*	.....	−1.7	.001
17.....	545	0 4.8	− 3 7	7.2	M2	.01	−0.2	.003
19.....	571	0 5.1	+45 31	5.1	cF2	.00	0.2	.010
20.....	587	0 5.2	− 5 48	6.0	G9	.03	0.8	.009
ADS 128A....	.....	0 5.4	+66 35	9.7†	Ko	.14	5.3	.013
BD +32°11.....	613	0 5.4	+32 34	7.2	K4	.05	0.3	.004
22.....	693	0 6.2	−16 1	5.0	F5	.28	3.6	.052
24.....	739	0 6.7	−35 42	5.2	F4	.20	3.7	.050
25.....	787	0 7.1	−18 30	5.5	K5	.04	0.4	.010
26.....	877	0 8.0	−23 2	6.7	G5	.03	2.2	.013
βGC 71A....	919	0 8.5	+75 28	7.6	M4	.03	−0.2	.003
βGC 71B....	947	0 8.8	+75 28	7.9	G4	.01	0.6	.003
30A....	1014	0 9.3	− 8 20	5.4	M4	.06	−0.4	.007
31.....	1013	0 9.4	+19 39	4.9	M2	.09	0.2	.011
BD −15°32.....	1037	0 9.6	−15 22	6.9	G8	.....	2.4	.013
33.....	1038	0 9.6	−19 29	4.7	M1	.07	−0.4	.010
35A....	1061	0 9.8	+ 8 16	5.9	A9s	.10	1.7	.014
35B....	.....	0 9.8	+ 8 16	7.8	A9s	.10	2.7	.010
BD −15°38.....	1195	0 11.2	−15 2	8.6	F5	.....	3.4	.009
ADS 218A....	1210	0 11.4	+54 6	8.1†	A6n	.16	1.8	.005
ADS 218B....	.....	0 11.4	+54 6	8.8	A9n	.16	2.7	.006
39.....	1227	0 11.4	+ 7 41	6.2	G6	.04	0.8	.008
ADS 221A....	1224	0 11.5	+35 56	8.2†	F7	.08	3.4	.011
40.....	1228	0 11.5	+ 1 18	7.3	M5	.02	−0.3	.003
41A....	1239	0 11.6	+60 59	5.8	G4	.00	0.0	.007
20C 16.....	.....	0 11.8	+40 23	8.7	Mo	.55	8.0	.072
ADS 237A....	1309	0 12.2	+15 57	8.4	G4	.05	5.0	.021
45AB..	1317	0 12.3	+ 8 19	7.6†	G1	.12	4.1	.020
45C....	.....	0 12.3	+ 8 19	8.0	A9s	.12	2.7	.009
48.....	1352	0 12.6	+15 47	7.4	F5	0.22	3.7	.018
ADS 246A....	1326	0 12.7	+43 27	8.1	M3	2.89	10.2	.263
ADS 246B....	.....	0 12.7	+43 27	10.9	M5	2.89	12.1	0.174

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
49.....	1367	$0^h12^m.7$	+ 1° 8′	6.4	G6	0″.08	0.9	0″.008
53A....	1522	0 14.3	− 9 23	3.8	K3	.04	0.2	.019
54.....	1563	0 14.8	+15 42	6.8	G8	.02	0.4	.005
56.....	1635	0 15.5	+ 7 38	5.6	K3	.02	0.2	.008
57.....	1671	0 15.9	+37 25	5.2	F2	.08	2.9	.035
T Ceti.....	1760	0 16.7	−20 37	5.6	M6e*	.08	−0.6	.006
C 35.....	1779	0 17.0	−27 16	9.0	G2	.44	4.5	.013
62A....	1796	0 17.2	+12 56	6.4	K2	.06	0.4	.006
63.....	1835	0 17.7	−12 46	6.4	G2	.40	4.2	.036
64.....	1879	0 18.0	−16 30	6.6	M3	.04	−0.4	.004
BD +44°76.....	1918	0 18.4	+44 32	7.7	G7	.05	0.9	.004
66.....	1952	0 18.8	+43 43	6.6	A7n	.02	1.2	.008
C 41.....	2025	0 19.3	−27 35	7.8	K6	.67	7.2	.076
69.....	2023	0 19.4	− 2 46	6.3	K1	.06	0.3	.006
70.....	2035	0 19.5	+13 46	6.8	K0	.02	0.8	.006
73A....	2114	0 20.3	+ 1 23	6.0	G5	.03	0.4	.008
BD +33°39.....	2126	0 20.4	+33 34	8.3	K0	.02	1.1	.004
75.....	2140	0 20.5	+ 7 8	7.2	K3	.07	0.6	.005
79.....	2273	0 21.5	− 0 36	6.4	G4	.07	1.2	.009
BD +30°59.....	2313	0 21.9	+30 37	7.6	M1	.03	−0.1	.003
BD +33°47.....	2357	0 22.3	+33 29	8.0	G8	.08	1.1	.004
80.....	2410	0 22.8	+18 58	6.7	G7	.02	0.8	.007
81.....	2411	0 22.8	+17 20	5.3	M3	.12	−0.6	.007
84.....	2436	0 23.0	+15 54	6.5	K5	.02	0.1	.005
C 49.....	2454	0 23.2	+ 9 39	6.0	F0	.21	2.9	.024
86.....	2589	0 24.5	+76 28	6.4	G9	.34	2.5	.017
88.....	2629	0 24.8	− 1 40	7.5	F1	.17	3.1	.013
89A....	2628	0 24.8	+29 12	5.3	F3	.07	2.6	.029
90A....	2637	0 24.9	− 4 31	6.0	M0	.01	0.1	.007
96.....	2774	0 26.2	+52 17	5.7	K2	0.06	0.3	.008
ADS 433–440A....	.....	0 26.3	+66 42	10.3†	M3	1.74	9.5	.069
98.....	2806	0 26.4	+15 28	7.1	K2	0.05	−0.2	.003
104A....	2910	0 27.3	+19 45	5.5	K0	.14	0.8	.011
106A....	2942	0 27.5	+27 44	6.4	G6	.02	1.0	.008
BD +61°115.....	2973	0 27.9	+62 14	8.0	G4	.....	0.0	.003
110A....	3074	0 28.8	−35 32	6.6	F8	.52	3.4	.023
112A....	3125	0 29.4	− 5 6	7.4†	G0	.08	3.7	.018
116A....	3196	0 30.1	− 4 9	5.9†	F7	.41	4.2	.046
117.....	3229	0 30.4	− 1 3	5.9	F2	.14	3.3	.030
ADS 497A....	3266	0 30.7	+29 27	8.6	G4	.45	5.1	.020
ADS 497B....	.....	0 30.7	+29 27	9.4	G6	.45	5.4	.016
119.....	3283	0 30.8	+59 47	5.8	A2n	.00	1.9	.017
121.....	3346	0 31.3	+43 56	5.4	K5	.04	−0.2	.008
125.....	3421	0 32.0	+34 51	5.6	G0	.02	0.6	.010
126.....	3440	0 32.2	+81 56	6.4	F6	0.14	3.6	0.027

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	127AB..	3443	0^h32^m2	−25°19′	6.4†	G7	1″.38	5.4	0″.063
	128.....	3457	0 32.4	+ 2 35	6.6	K4	0.12	0.2	.005
	129A....	3512	0 33.0	− 1 3	6.9	K3	.05	0.4	.005
	130.....	3546	0 33.3	+28 46	4.5	G3	.34	2.6	.042
	131A....	3574	0 33.6	+48 48	5.7	K5	.01	−0.3	.006
	132A....	3627	0 34.0	+30 19	3.8†	K4	.16	0.5	.022
C	80.....	3628	0 34.0	+ 2 35	7.4	G2	.82	4.3	.024
BD	+62°130.....	3637	0 34.1	+62 41	7.7	F4	.....	1.7	.006
	133.....	3651	0 34.2	+20 43	6.1	K1	.60	5.9	.091
	134A....	3690	0 34.7	+20 53	5.6	G7	.05	0.8	.011
	134B....	.....	0 34.7	+20 53	8.8	Fo	.05	3.2	.008
	135A....	3712	0 34.8	+55 59	2.5	G7	.06	−0.4	.026
C	86.....	3765	0 35.3	+39 39	7.5	K5	.80	6.5	.063
C	87.....	3795	0 35.5	−24 21	6.2	G3	.71	4.3	.042
	137A....	3807	0 35.6	− 4 54	6.1	G7	.02	0.8	.009
	138.....	3817	0 35.7	+38 55	5.4	G5	.01	0.9	.013
ADS	566A....	3821	0 35.7	− 7 47	7.0	G3	.10	4.8	.036
ADS	566B....	.....	0 35.7	− 7 47	10.3	M1	.10	8.6	.046
ADS	582A....	3891	0 36.4	+70 49	7.3	A1s	.04	1.3	.006
ADS	588A....	3972	0 37.2	+ 3 37	7.7†	F6	.06	3.4	.014
BD	+45°181.....	3989	0 37.4	+45 21	7.4	Mo	.05	0.4	.004
BD	+70° 43.....	4042	0 37.8	+70 17	6.9	G8	.04	0.7	.006
C	90.....	.....	0 38.2	+33 18	8.6	K5	.43	7.5	.060
ADS	608A....	4096	0 38.3	− 1 26	8.8	G3	.31	4.7	.015
ADS	616A....	4134	0 38.6	+45 41	8.9†	F2	.08	3.2	.007
	147.....	4128	0 38.6	−18 32	2.2	G6	.23	0.5	.046
	150A....	4161	0 39.0	+74 26	5.9†	A3s	.03	1.2	.011
	151.....	4188	0 39.2	−11 9	4.9	G6	.11	0.5	.013
C	98.....	4256	0 39.9	+ 1 15	8.1	K5	.59	6.5	.048
BD	+55°157.....	4266	0 40.0	+56 14	7.6	F1	.01	1.2	.005
	156.....	4301	0 40.3	− 5 11	6.4	Mo	.04	−0.5	.004
	157.....	4307	0 40.5	−13 25	6.1	F8	.20	4.3	.044
BD	+58°101.....	4362	0 40.9	+59 2	6.5	cF9	.02	−1.7	.002
	160.....	4398	0 41.2	−23 4	5.6	G6	.19	2.4	.023
BD	+45°199.....	4406	0 41.3	+45 49	7.6	G3	.05	4.0	.019
	161.....	4408	0 41.3	+14 56	5.6	M4	.06	−0.3	.007
	162.....	4482	0 41.8	+11 26	5.7	G9	.06	0.7	.010
	164.....	4502	0 42.0	+23 43	4.6†	G8	.13	0.4	.014
	165.....	4526	0 42.2	+ 6 12	6.2	G6	.02	0.5	.007
	167.....	4568	0 42.6	+20 23	6.6	F6	0.16	2.5	.015
	168A....	4614	0 43.0	+57 17	3.6	F9	1.24	4.8	.174
	168B....	.....	0 43.0	+57 17	7.2	Mo	1.24	8.0	.145
	170.....	4627	0 43.1	+ 6 45	6.1	G7	0.11	0.8	.009
	171.....	4628	0 43.1	+ 4 46	5.8	K4	1.37	6.5	.138
C	105.....	4635	0 43.3	+69 54	8.0	K2	0.41	5.9	0.038

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
173.....	4656	$0^h43^m.5$	+ 7° 2′	4.6	K5	0″.09	0.3	0″.014
174.....	4676	0 43.7	+16 24	5.7†	F6	.20	3.9	.044
177A....	4730	0 44.4	−14 6	5.8	K5	.14	0.8	.010
C 106.....	4747	0 44.4	−23 46	7.2	G7	.52	5.6	.048
178B....	4757	0 44.5	+27 10	6.3	F2	.09	1.5	.011
178A....	4758	0 44.5	+27 10	6.3	Fo	.09	1.6	.011
179.....	4775	0 44.7	+63 42	6.0†	F1‡	.03	3.2	.027
181.....	4813	0 45.1	−11 11	5.2	F9	.32	4.1	.060
BD +61°178.....	4817	0 45.2	+61 16	6.4	cK5	.00	−3.6	.001
188.....	4928	0 46.2	+ 2 51	6.5	G7	.09	0.9	.008
189A....	5015	0 47.1	+60 35	4.9	F8	.19	3.9	.063
ADS 716A....	5058	0 47.3	−23 9	7.4	Go	.25	4.2	.023
190A....	5098	0 47.8	−24 33	5.9†	K2	.04	0.3	.008
191.....	5112	0 47.9	− 1 41	4.9	Mo	.02	−0.2	.010
C 119.....	5133	0 48.1	−30 54	7.2	K5	.63	6.8	.083
193A....	5234	0 49.1	+58 26	5.0	K2	.05	0.1	.010
BD +86° 14.....	5256	0 49.2	+86 47	8.9	G4	.32	4.6	.014
194.....	5268	0 49.2	− 9 17	6.4	G3	.05	2.5	.017
197A....	5286	0 49.6	+23 5	6.1†	K1	.14	2.3	.017
C 122.....	5351	0 50.4	+68 31	9.4	K6	.74	6.9	.032
200.....	5395	0 50.7	+58 38	4.8	G4	.10	2.6	.036
202.....	5437	0 51.0	−11 48	5.5	K5	.02	−0.5	.006
206.....	5516	0 51.9	+22 53	5.1†	G5	.06	0.5	.012
BD − 0°146.....	5544	0 52.1	− 0 12	7.7	G9	.02	−0.2	.003
209.....	5575	0 52.4	+28 27	5.6	G6	.02	0.2	.008
210.....	5612	0 52.7	+13 9	6.4	G6	.02	0.4	.006
BD +70° 65.....	5715	0 53.7	+70 28	6.5	A4n	.09	2.0	.013
211.....	5722	0 53.7	−11 55	5.8	G7	.03	0.8	.010
BD +59°161.....	5747	0 54.0	+59 59	7.2	G8	.04	0.3	.004
215A....	5780	0 54.3	+ 0 15	7.8	Mo	.13	−0.9	.002
216A....	5789	0 54.4	+44 10	6.5†	A1n	.04	1.6	.010
BD +13°143.....	5802	0 54.5	+14 4	9.0	Fo	.01	3.1	.007
217.....	5820	0 54.6	+ 5 57	6.3	M2	.02	−0.9	.004
218.....	5848	0 55.0	+85 43	4.5	K2	.09	0.4	.015
ADS 838A....	5890	0 55.3	+60 31	8.9	F1	.05	2.6	.005
BD +44°215.....	5916	0 55.6	+44 55	7.0	G2	.10	3.6	.021
222.....	6077	0 56.9	+ 7 24	7.8	G9	.04	1.0	.004
C 136.....	6101	0 57.2	+ 4 31	8.4	K6	.44	6.9	.050
ADS 862A....	6114	0 57.3	+46 50	7.2†	A3n	.10	1.7	.008
223A....	6116	0 57.3	+40 48	5.9	A5s	.02	0.7	.009
ADS 868A....	6130	0 57.4	+60 32	5.9	A9s	.02	0.7	.009
226.....	6186	0 57.8	+ 7 21	4.4	G5	.08	1.0	.021
228.....	6203	0 58.0	− 5 22	5.7	K1	.15	0.6	.010
230A....	6288	0 58.7	+ 0 50	6.1	Fo	.12	3.4	.029
231.....	6314	0 59.0	+39 27	6.7	A2n	0.09	2.1	0.012

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	232.....	6319	$0^h59^m.1$	+86°37′	6.4	K2	0″.06	0.4	0″.006
	233.....	6386	0 59.7	+ 5 7	6.2	K5	.03	0.7	.008
	234.....	6397	0 59.8	+14 24	5.9†	F2	.04	3.0	.026
BD	+70° 78.....	6414	1 0.0	+70 24	6.6	A4n	.06	2.0	.012
BD	+61°206.....	6416	1 0.0	+62 14	7.1†	A3n‖	0.10	2.1	.010
C	142.....	.....	1 0.4	+63 24	8.8	M1	1.55	9.0	.110
ADS	902A.....	.....	1 0.6	+12 48	8.6†	F9	.....	2.5	.006
	237.....	6482	1 0.6	−10 31	6.4	G8	0.05	1.0	.008
	238A.....	6479	1 0.6	+ 4 23	6.8	F5	.11	3.1	.018
	239.....	6473	1 0.7	+79 29	6.4	G6	.05	2.5	.017
	240B.....	6480	1 0.7	+ 4 23	7.6	F4	.11	3.4	.014
	241A.....	6476	1 0.7	+31 39	6.6	K2	.02	0.7	.007
	243.....	6557	1 1.3	+12 25	6.2	G7	0.04	0.9	.009
	244.....	6582	1 1.6	+54 26	5.3	G4	3.76	5.4	.105
C	146.....	6660	1 2.2	+22 26	8.6	K6	0.52	7.1	.050
	248.....	6680	1 2.5	+31 29	6.3	A7n	.20	1.6	.011
	250.....	6706	1 2.7	−10 19	5.9	F3	.15	3.1	.027
	251.....	6734	1 2.8	+ 1 28	6.7	G5	.45	4.1	.030
	252.....	6763	1 3.2	+ 5 7	5.7	A8s	.33	1.9	.017
C	149.....	6755	1 3.3	+61 1	7.8	F5	.64	4.1	.018
	255.....	6805	1 3.6	−10 43	3.6	K1	.25	0.5	.024
C	150.....	6840	1 4.1	+67 15	6.6	F6	.24	3.5	.024
	259A.....	6860	1 4.1	+35 5	2.4	Mo	.22	0.2	.036
	261.....	6903	1 4.5	+19 7	5.6	F5	.00	.7	.017
	262.....	6920	1 4.6	+41 33	5.7	F7	.14	3.6	.038
	266.....	6976	1 5.2	− 9 26	6.6	G6	.04	0.8	.007
BD	+59°199.....	7010	1 5.4	+59 58	7.9	Ko	.02	1.4	.005
	267.....	7014	1 5.4	+ 1 55	6.2	K4	.00	0.1	.006
	270.....	7087	1 6.1	+20 30	4.9	G9	.02	0.1	.011
	271.....	7106	1 6.2	+29 34	5.0†	K1	.08	0.6	.013
	273.....	7147	1 6.6	− 2 47	6.2	K4	.06	0.0	.006
	274.....	7158	1 6.8	+44 48	6.6	M1	.04	0.0	.005
ADS	988B.....	.....	1 7.4	+31 33	7.7	A8n	.....	2.2	.008
	275A.....	7218	1 7.4	+ 1 57	6.8	F4	.21	3.2	.019
	276.....	7238	1 7.7	+79 23	6.4	F5	.08	2.7	.018
	278.....	7268	1 7.8	− 7 19	6.9	G8	.06	0.9	.006
	279.....	7311	1 8.1	−35 44	7.0	G8	.04	0.8	.006
	281A.....	7318	1 8.3	+24 3	4.9†	G7	.05	0.6	.014
	283(B)..	7345	1 8.5	+ 7 3	6.8†	F6	.14	3.5	.022
	285A.....	7439	1 9.4	− 8 28	5.2	F2	.30	3.1	.038
	285B.....	7438	1 9.4	− 8 28	7.8	G7	.30	5.8	.040
	286.....	7446	1 9.5	+ 6 28	6.2	G6	.03	0.4	.007
	287.....	7476	1 9.7	− 1 31	5.8	F3	.22	3.2	.030
	290.....	7672	1 11.5	− 3 2	5.5	G5	.13	1.2	.014
	291.....	7727	1 11.9	− 2 48	6.8	F8	0.30	3.6	0.023

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
292.....	7732	1h12m0	+77° 3′	6.4	G4	0″.09	1.3	0″.010
BD +55°290.....	7861	1 13.2	+55 48	8.9	M6	.02	0.1	.002
ADS 1057A....	7895	1 13.5	− 1 23	8.1	G8	.49	5.5	.030
298A....	7927	1 13.8	+57 42	5.5†	cF7	.01	−2.8	.002
C 167.....	7983	1 14.0	− 9 27	8.9	Go	.53	4.5	.013
302A....	8036	1 14.7	− 1 2	6.0	G3	.01	0.9	.010
BD +14°204.....	8110	1 15.4	+15 11	7.5	G6	.04	4.0	.020
303.....	8126	1 15.6	+28 13	5.6	K5	.08	0.3	.009
BD −14°258.....	8142	1 15.7	−14 25	7.0	K2	.....	0.0	.004
C 174.....	.....	1 15.8	+30 49	8.2	K4	.50	6.2	.040
304.....	8207	1 16.4	+45 0	5.0	G9	.04	0.4	.012
BD +15°198.....	8248	1 16.7	+15 17	7.5	F4	.07	3.0	.013
C 177.....	8262	1 16.9	+18 10	8.0	G2	.53	4.5	.020
305.....	8335	1 17.5	− 0 58	6.5	Ko	.02	0.0	.005
306.....	8334	1 17.5	+ 1 12	6.5	Mo	.07	−0.4	.004
BD +76° 42.....	8364	1 17.8	+77 9	8.0	F8	.01	3.0	.010
310A....	8491	1 18.9	+67 36	5.0	G8	.09	0.7	.014
313A....	8512	1 19.0	− 8 42	3.8	Ko	.23	2.1	.046
314.....	8538	1 19.3	+59 43	2.8	A3n	.31	1.4	.052
C 185.....	8553	1 19.5	+17 59	8.6	K4	.61	6.8	.044
ADS 1131A....	8627	1 20.0	− 6 28	7.5†	F1‖	.....	2.0	.008
317.....	8705	1 20.7	−15 7	5.2	K3	.04	0.5	.011
318.....	8723	1 20.9	+18 39	5.3	F1	.04	3.3	.040
319.....	8763	1 21.3	+18 43	5.6	K1	.08	0.5	.010
320.....	8779	1 21.3	− 0 55	6.5	Ko	.05	1.0	.008
321A....	8799	1 21.7	+44 53	5.0	F2	.36	2.8	.036
BD +29°240.....	8826	1 21.9	+30 1	8.5	F3	.08	3.1	.008
322.....	8829	1 21.9	−13 35	5.7	F1	.02	3.0	.029
324AB..	8875	1 22.5	+ 4 50	7.9†	Go	.12	4.1	.017
325A....	8890	1 22.6	+88 46	2.1	cF7	.04	−2.2	.014
325B....	.....	1 22.6	+88 46	8.8	F1	.04	2.8	.006
BD +29°243.....	8909	1 22.7	+30 2	6.9	F4	.09	3.7	.023
326.....	8941	1 23.1	+16 34	6.8	F8	.11	3.2	.019
C 196.....	8997	1 23.6	+21 13	8.2†	K4	.50	6.4	.044
327.....	9021	1 23.8	+69 45	6.3†	F6	.16	3.7	.030
328.....	9024	1 23.8	+ 6 47	6.7	Fo	.06	2.8	.017
330.....	9057	1 24.1	+46 29	5.3	Ko	.04	0.2	.010
332.....	9138	1 24.9	+ 5 38	5.1	K4	.29	0.2	.010
333.....	9166	1 25.2	+67 54	7.0	K2	.12	0.3	.005
334A....	9228	1 25.7	−26 43	6.0	K4	.05	0.2	.007
BD +29°256.....	9269	1 26.1	+30 6	8.4	G9	.09	1.0	.003
335A....	9270	1 26.1	+14 50	3.7	G3	.03	0.4	.022
BD +57°320.....	9352	1 27.0	+57 49	6.0	cK1	.01	−2.0	.003
C 204.....	9407	1 27.3	+68 26	6.7	G3	.40	4.4	.035
338.....	9408	1 27.4	+58 43	4.9	G6	0.04	0.9	0.016

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
ADS 1226AB..	9454	$1^h27^m.7$	+71°56′	8.5†	G2	0″.04	0.7	0″.003
BD +29°260.....	9483	1 28.0	+29 54	8.1	A5n	.02	1.5	.005
342.....	9640	1 29.4	+17 57	6.0	M2	.09	0.1	.007
344.....	9670	1 29.7	+ 0 26	7.0	F8	.32	3.6	.021
346.....	9746	1 30.3	+48 13	6.2	K1	.01	0.2	.006
349A....	9774	1 30.5	+72 32	5.5	G5	.01	0.3	.009
350.....	9826	1 30.9	+40 54	4.2	G0	.42	3.7	.079
βGC 831A....	9847	1 31.0	−18 2	7.1	G2	.35	4.0	.024
ADS 1257A....	9855	1 31.1	+ 3 48	7.9	K4	.01	0.5	.003
351.....	9856	1 31.1	−15 55	5.5	K1	.03	0.4	.010
355.....	9900	1 31.6	+57 28	5.7	G9	.00	−0.9	.005
356.....	9919	1 31.8	+11 38	5.6	A5n	.08	2.1	.020
357.....	9927	1 31.9	+48 7	3.8	K2	.13	0.2	.019
C 226.....	10015	1 32.7	+29 4	8.7	G8	.42	5.0	.018
360.....	10072	1 33.3	+43 53	5.5†	G5	.02	1.1	.013
C 227.....	10086	1 33.5	+45 23	6.7	G4	.32	4.9	.044
C 229.....	10126	1 33.9	+27 36	7.9	G6	.51	4.6	.022
361A....	10113	1 33.9	+16 7	6.9	G6	.03	0.7	.006
362.....	10135	1 33.9	+13 47	6.9	K0	.10	0.9	.006
365.....	10148	1 34.1	−21 47	6.0†	A4n	.10	1.8	.014
C 231.....	10145	1 34.2	+66 25	7.6	G7	.74	4.9	.029
367.....	10164	1 34.3	+15 54	6.1	K2	.07	0.7	.008
368.....	10204	1 34.7	+42 48	5.5	A9n	.14	1.5	.016
372.....	10307	1 35.7	+42 7	5.1	G0	.82	4.4	.072
373A....	10308	1 35.7	+25 14	7.0†	F3‖	.11	3.2	.017
BD +44°352.....	10322	1 35.8	+45 5	8.8	K5	.01	0.3	.002
374A....	10332	1 35.9	+60 3	7.4	K1	.01	−0.2	.003
375.....	10348	1 36.0	+29 32	6.0	G6	.01	0.7	.009
378.....	10380	1 36.2	+ 4 59	4.7	K4	.02	0.4	.014
C 238.....	10436	1 36.8	+63 20	8.2	M0	.70	8.2	.100
381A....	10453	1 36.8	−11 49	6.1†	F2	.41	3.3	.027
381B....	.....	1 36.8	−11 49	7.4	F3	.41	3.7	.018
382A....	10476	1 37.1	+19 47	5.3	G9	.73	5.9	.132
BD +44°354.....	10486	1 37.2	+44 48	6.5	K2	.14	2.0	.013
C 240.....	10519	1 37.4	−18 24	7.4	G1	.54	4.1	.022
BD +55°394.....	.....	1 37.7	+56 1	9.2	M0	.02	−0.8	.001
387.....	10550	1 37.7	− 4 12	5.3	K3	.03	−0.4	.007
BD +45°432.....	10597	1 38.3	+45 39	6.5	K5	0.03	0.4	.006
391.....	10700	1 39.4	−16 28	3.6	G4	1.92	5.6	.251
392.....	10697	1 39.5	+19 35	6.2	G4	0.11	4.7	.050
393.....	10761	1 40.1	+ 8 39	4.5	G6	.08	0.6	.017
BD + 7°275.....	10783	1 40.4	+ 8 4	6.6	A3sp*	.....	1.0	.008
394.....	10780	1 40.5	+63 22	5.7	K0	.63	5.6	.096
396A....	10830	1 41.0	−25 33	5.4	F1	.17	2.4	.025
397.....	10824	1 41.0	− 6 14	5.5	K4	0.04	0.3	0.009

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
398.....	10845	1^h41^m2	+16°55′	6.8†	A7n	0″.05	2.1	0″.011
402.....	10975	1 42.7	+37 27	6.0	G7	.11	0.7	.009
404.....	10995	1 42.9	+16 31	7.3	G0	.06	2.8	.013
405.....	11007	1 43.0	+32 11	5.8	F6	.35	4.1	.046
408.....	11131	1 44.5	−11 12	6.8	G1	.16	4.1	.029
409.....	11151	1 44.5	+51 26	5.9	F3	.12	3.2	.029
410A....	11154	1 44.6	+21 47	6.2†	K0	.02	0.7	.008
411.....	11171	1 44.7	−11 11	4.8	F1	.18	2.2	.030
413.....	11262	1 45.5	−38 54	6.5	F7	.27	3.8	.029
414.....	11257	1 45.6	+10 33	5.9	F2	.07	2.7	.023
416.....	11353	1 46.5	−10 50	4.2†	K0	.05	0.0	.014
420A....	11428	1 47.3	+40 14	5.6	K1	.01	0.0	.008
421.....	11443	1 47.4	+29 6	3.9†	F2	.23	2.4	.050
C 251.....	11507	1 48.0	−22 56	8.9	M0	.86	8.6	.087
426.....	11559	1 48.4	+ 2 42	5.1†	G7	.03	0.6	.013
BD +33°318.....	11635	1 49.1	+33 15	8.7	G9	.03	0.4	.002
430(B)..	11727	1 50.0	+36 47	6.1	M0	.00	−0.3	.005
432(A)..	11749	1 50.2	+36 46	5.8	G8	.18	0.7	.010
434.....	11763	1 50.3	+23 5	6.0	G8	.01	0.3	.007
435AB..	11803	1 50.7	+ 1 21	7.3†	F9	.25	4.4	.026
ADS 1552A....	.....	1 51.7	+18 28	9.8	K5	.05	1.1	.002
436.....	11909	1 51.9	+17 20	5.5†	G7	.04	0.3	.009
437.....	11930	1 52.0	−23 1	5.2	K4	.08	0.4	.011
439.....	11949	1 52.2	+48 43	5.8	G7	.04	1.3	.013
BD +32°356.....	.....	1 52.3	+32 28	8.8	F9	.....	2.3	.005
441B....	.....	1 52.4	+23 6	7.4	G1	.09	4.3	.024
BD +33°330.....	12050	1 53.1	+33 51	7.6	G6	.03	0.8	.004
446A....	12111	1 53.7	+70 25	4.7†	A6s	.06	1.5	.023
X Trianguli*.....	12211	1 54.8	+27 24	9.0†	A3s	.01	1.8	.004
450.....	12235	1 54.9	+ 2 37	5.8	G1	.34	4.1	.046
451.....	12255	1 55.1	−21 19	5.7	M1	.01	−0.1	.007
452.....	12230	1 55.1	+76 48	5.4	A2n	.14	2.0	.021
453.....	12274	1 55.3	−21 34	4.2	M1	.13	0.1	.015
455A....	12292	1 55.5	− 9 0	5.7	M5	.09	−0.4	.006
460A....	12339	1 56.0	+75 38	5.3	G5	.02	0.8	.013
BD +70°157.....	12350	1 56.0	+70 43	7.6	F0	.04	2.9	.011
BD +53°440.....	12433	1 56.8	+54 13	7.7	F5	.03	3.1	.012
463A....	12447	1 56.9	+ 2 17	4.8†	A2n‡	.04	2.0	.027
463B....	12446	1 56.9	+ 2 17	5.7†	A3n	.04	1.5	.014
468(A)..	12533	1 57.8	+41 51	2.3	K3	.07	−0.2	.032
470A....	12558	1 58.0	+25 27	5.9†	F4	.11	3.0	.026
472.....	12594	1 58.2	+17 46	6.4	K4	.02	0.3	.006
473A....	12641	1 58.7	− 0 49	6.0	G5	.09	0.8	.009
475.....	12800	2 0.5	+71 5	6.7	F8	.39	4.3	.033
20C 144.....	12873	2 1.0	−24 52	9.5	G9	0.42	5.2	0.014

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
ADS 1652A	12889	$2^h\ 1^m.1$	−24°51′	9.2	K5	0″.42	6.5	0″.029
477	12929	2 1.5	+22 59	2.2	K1	.24	0.4	.044
C 274	13043	2 2.5	− 1 5	6.9	G1	.47	4.2	.029
481	13137	2 3.4	+53 22	6.4	G8	.06	0.3	.006
483A	13174	2 3.7	+25 28	5.1	A5n	.09	1.5	.019
485	13228	2 4.1	− 2 48	7.1	F5	.11	3.3	.017
486	13222	2 4.1	+73 33	6.2	G6	.07	0.8	.008
491	13325	2 5.1	+19 2	5.9	M3	.09	−0.2	.006
493	13363	2 5.5	+25 28	6.2	K4	.01	0.5	.007
βGC 1131A	13403	2 5.9	+56 45	7.0	G1	.33	3.9	.024
495	13421	2 6.1	+ 8 6	5.7	F8	.17	3.1	.030
496	13468	2 6.5	− 2 18	6.0	G9	.03	0.8	.009
497A	13480	2 6.6	+29 50	6.2†	G4	.09	0.9	.009
497B	.....	2 6.6	+29 50	7.2†	F2	.09	3.2	.016
498	13474	2 6.6	+66 3	6.2	F2	.00	3.3	.026
500A	13530	2 7.0	+50 36	5.7†	G6	.39	0.4	.009
BD +57°521	13543	2 7.1	+57 27	8.9	G8	.09	0.4	.002
501	13555	2 7.2	+20 44	5.4	F4	.16	3.3	.038
C 286	13579	2 7.5	+67 13	7.2	K4	.60	6.4	.069
ADS 1709A	13594	2 7.6	+47 1	6.4†	F2	.10	3.3	.024
502	13596	2 7.6	+14 49	6.0	M1	.10	0.0	.006
503(B)	.....	2 7.7	− 2 52	7.8	G4	.37	4.8	.025
504(A)	13612	2 7.7	− 2 52	5.7	F9	.37	4.1	.048
505	13611	2 7.7	+ 8 23	4.8†	G4	.03	0.1	.011
BD +56°458	13634	2 7.9	+57 13	9.2	G9	.01	−0.2	.001
C 288	13783	2 9.2	+64 30	8.4	G5	.50	4.9	.020
BD +56°466	13784	2 9.2	+57 9	9.5	A9s	0.01	1.7	.003
C 289	.....	2 9.5	− 1 40	8.4	F8	1.03	3.6	.011
C 291	13825	2 9.7	+23 49	6.9	G7	0.49	5.0	.042
509	13872	2 10.0	+24 35	5.6	F4	.12	3.4	.036
510	13871	2 10.0	+25 19	5.8	F3	.19	3.2	.030
513	13982	2 10.9	+57 26	6.1	K3	0.07	0.1	.006
514A	13974	2 10.9	+33 46	5.4†	G0	1.18	4.1	.055
515A	13994	2 11.0	+57 3	6.2	G6	0.01	0.3	.007
516A	14044	2 11.3	−10 17	7.5†	G2	.27	3.9	.019
BD +41°435	14064	2 11.4	+42 8	7.9	F3	.02	2.5	.008
518	14129	2 12.0	− 6 53	5.7	G8	.14	0.3	.008
BD +56°539	14185	2 12.6	+57 9	9.2	K3	.01	−0.3	.001
523	14214	2 12.8	+ 1 17	6.1†	F8	.53	3.9	.036
BD +22°329	14262	2 13.3	+22 43	6.4	A7n	.05	1.6	.011
BD +56°547	14270	2 13.4	+56 32	8.2	M3	.01	−1.1	.001
528	14305	2 13.6	+19 14	6.8	F8	.12	4.4	.033
BD +56°551	14330	2 13.9	+56 42	10.3*	M1	.00	−1.5	.000
C 298	.....	2 14.0	+70 43	8.6	K6	.62	6.6	.040
BD − 3°355	14411	2 14.4	− 3 26	9.1	K5	0.01	0.4	0.002

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
C 300	14402	2^h14^m5	+68°18′	7.4	K1	0″.13	0.9	0″.005
BD +57°550	14404	2 14.5	+57 24	8.6	M2	.01	−2.1	.001
532	14412	2 14.5	−26 25	6.4	Ko	.50	5.9	.079
SU Persei	14469	2 15.1	+56 9	7.3*	M4	.02	−1.4	.002
RS Persei	14488	2 15.3	+56 39	8.7*	M6	.01	−0.4	.001
BD +55°600	14543	2 15.9	+56 10	8.4	G9	.01	−0.4	.002
BD +56°595	.....	2 16.2	+56 46	8.6	M1	.01	−2.1	.001
BD +56°597	14580	2 16.3	+56 46	11.0*	Mo	.01	−1.7	.000
BD +22°334	14595	2 16.4	+22 25	6.6	G4*	.03	0.7	.007
BD +15°331	14610	2 16.5	+15 33	8.1	F3	.11	3.2	.010
536	14622	2 16.6	+40 57	5.9	F2	.13	2.8	.024
539	14652	2 16.8	− 0 4	5.9	M2	.01	−0.5	.005
ADS 1820A	14662	2 16.9	+54 55	6.5	cF8	.03	−1.9	.002
541	14691	2 17.1	−11 14	5.6	A8n	.17	1.8	.017
BD −14°434	14692	2 17.1	−14 44	7.4	A8n	.....	2.1	.009
542	14770	2 17.8	+49 33	5.5	G5	.05	0.5	.010
BD +33°422	14783	2 17.9	+33 24	7.6	K3	.06	0.4	.004
543	14802	2 18.0	−24 16	5.4	G1	.21	4.0	.052
ADS 1832A	14825	2 18.3	+57 44	7.9†	A5s	.04	1.4	.005
BD +56°609	14826	2 18.3	+57 0	8.5	M4	.01	−0.9	.001
545	14872	2 19.0	+49 50	4.9	K5	.03	0.0	.010
BD +14°392	14887	2 19.0	+15 4	7.8	Fo	.03	2.5	.009
550A	15089	2 20.8	+66 57	4.9†	A3sp*	.02	0.0	.010
550B	.....	2 20.8	+66 57	7.0	F5	.01	3.2	.017
550C	.....	2 20.8	+66 57	8.2	G4	.01	4.7	.020
BD +55°624	15091	2 20.8	+55 35	9.2	A8n	.02	1.9	.003
552	15138	2 21.2	+50 7	6.3	F1	.10	3.0	.022
555	15176	2 21.5	+31 21	5.8	K1	.05	0.8	.010
556	15228	2 22.1	+ 9 45	6.5	F4	.36	3.2	.022
559	15257	2 22.3	+29 13	5.4	A7n	.09	1.7	.018
562	15342	2 23.0	+81 12	8.5	K5	.02	−0.2	.002
566	15550	2 25.0	+19 25	6.1	A4n	.08	2.3	.017
568	15596	2 25.4	+17 16	6.4	G5	.10	3.7	.029
569	15634	2 25.7	−25 38	6.5	A0n	.09	2.4	.015
570	15652	2 26.0	−22 59	6.4	M1	.04	0.0	.005
572	15694	2 26.3	+ 1 49	5.4	K3	.01	0.7	.011
573A	15703	2 26.5	+51 52	7.0†	A2s	.01	1.7	.009
BD +29°434	15788	2 27.2	+29 31	7.8	G7	.03	0.3	.003
575	15798	2 27.3	−15 41	4.8	F3	.14	3.2	.048
576	15814	2 27.4	+14 36	6.4†	F7	.04	3.6	.027
C 329	15830	2 27.7	+42 21	7.6	G5	.45	5.3	.035
577	15920	2 28.5	+72 23	5.3	G6	.03	0.8	.013
BD +68°176	15948	2 28.8	+68 38	7.4	G9	.05	0.5	.004
581A	16028	2 29.5	+36 52	5.9	K4	.01	−0.1	.006
BD +30°414	16042	2 29.5	+30 14	8.5	G4	0.03	2.4	0.006

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
582.....	16058	2^h29^m7	+34°15′	5.6	M3	0″06	−0.6	0″006
583.....	16060	2 29.8	+ 7 2	6.2	G6	.11	1.0	.009
585.....	16082	2 29.9	+51 31	7.3	F9	.01	3.1	.014
BD +30°417.....	16090	2 30.0	+30 44	7.9	F9	.08	3.4	.013
586.....	16141	2 30.3	− 3 59	6.8	G2	0.45	4.1	.029
588.....	16160	2 30.6	+ 6 25	5.9	K4	2.32	6.7	.145
589A....	16161	2 30.6	+ 5 9	5.0	G5	0.04	0.5	.013
591.....	16234	2 31.2	+12 1	5.7	F5	.30	3.7	.040
592(B)..	16232	2 31.2	+24 13	7.4	F6	.15	3.7	.018
593(A)..	16246	2 31.2	+24 13	6.9†	F5	.14	3.4	.020
C 340.....	16397	2 32.6	+30 24	7.2	Go	.63	4.1	.024
ADS 2004A....	16396	2 32.9	+32 59	7.5†	K2	.04	0.7	.004
598.....	16446	2 33.2	−23 26	6.9	G9	.03	0.6	.005
ADS 2008A....	16480	2 33.5	+14 25	7.3	K3	.04	0.1	.004
600.....	16505	2 33.8	+67 38	7.8	K3	.01	0.4	.003
605.....	16620	2 34.7	−12 18	5.0	F5	.28	2.9	.038
607.....	16647	2 35.0	+ 5 41	6.2	F2	.05	2.9	.022
BD +44°558.....	16663	2 35.2	+45 4	8.4	F5	.10	3.1	.009
ADS 2059A....	16735	2 35.9	+53 6	6.1	Ko	.07	0.7	.008
610	16739	2 35.9	+39 46	5.5†	F9	.19	3.8	.046
612A....	16765	2 36.1	− 1 7	5.7	F6	.24	3.7	.040
BD +48°739.....	.....	2 36.2	+48 34	9.7	K6	.38	7.0	.029
BD +48°740.....	.....	2 36.2	+48 30	9.0†	K3	.....	−0.1	.002
C 345.....	16784	2 36.3	−30 34	8.1	F9	.60	3.0	.010
617A....	16895	2 37.4	+48 48	4.2	F5	.35	3.6	.076
617B....	.....	2 37.4	+48 48	10.0	M3	.35	9.3	.072
619.....	16901	2 37.6	+43 52	5.6	cGo	.00	−2.1	.003
622A....	16970	2 38.1	+ 2 49	3.6†	A2n	.21	1.6	.040
622B....	.....	2 38.1	+ 2 49	6.8	F4	.21	4.1	.029
624.....	17017	2 38.7	+17 20	6.5	K2	.07	0.7	.007
629.....	17094	2 39.5	+ 9 42	4.7†	F4	.28	2.2	.032
631.....	17206	2 40.4	−19 0	4.6	F5	.33	3.4	.057
BD +43°576.....	17245	2 41.0	+43 50	6.7	F2	.03	3.0	.018
ADS 2122A....	17332	2 41.8	+18 57	7.4†	F7	.18	3.8	.019
634.....	17361	2 42.0	+28 50	4.6	K1	.20	0.8	.017
BD +56°718.....	17378	2 42.2	+56 40	6.5	cA8	.02	−0.5	.004
635.....	17459	2 42.9	+17 52	6.0	K1	.05	0.9	.010
639A....	17506	2 43.4	+55 29	3.9	cK4	.03	−2.5	.005
644.....	17584	2 44.3	+37 54	4.3	A6n	.21	1.4	.026
ADS 2173A....	17647	2 44.9	+45 33	9.4†	G3	.57	5.0	.013
C 365.....	17660	2 45.0	+15 18	9.2	K6	.51	7.5	.046
646.....	17709	2 45.4	+34 39	4.7	Mo	.08	0.0	.011
ADS 2204A....	17785	2 46.1	+72 29	7.7	G1	.08	4.2	.020
650A....	17824	2 46.5	−21 25	4.8	Ko	.05	0.8	.016
653A....	17878	2 47.2	+52 21	4.4†	G1‡	0.01	1.1	0.022

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
654A....	17904	$2^h47^m.4$	+37°56′	5.6†	A6s	0″.10	1.2	0″.013
ADS 2218A....	18143	2 49.7	+26 28	7.7	K2	.33	5.7	.040
ADS 2218B....	.....	2 49.7	+26 28	9.3	M1	.33	8.7	.076
BD − 0°450.....	18145	2 49.7	− 0 28	6.7	G6	.02	0.8	.007
BD − 0°451.....	18175	2 50.0	+ 0 3	7.2	K2	.14	0.6	.005
660.....	18191	2 50.2	+17 56	5.9	M6	.02	−0.2	.006
BD +51°656.....	.....	2 50.3	+52 5	9.5	K1	.....	0.7	.002
BD +51°657.....	18200	2 50.3	+52 6	8.0	G6	.04	0.7	.003
BD +51°658.....	232733	2 50.3	+52 5	9.2	K2	.49	6.0	.023
661.....	18256	2 50.8	+17 37	5.6	F5	.34	3.1	.032
662.....	18262	2 50.9	+ 7 59	6.1	F7	.11	3.2	.026
665.....	18322	2 51.5	− 9 18	4.0	K2	.23	0.6	.021
BD − 0°460.....	18369	2 52.0	+ 0 3	6.7	A5n	.02	1.5	.009
667.....	18404	2 52.4	+20 16	5.8	F5	.22	3.2	.030
669A....	18438	2 52.8	+79 1	5.7	M1	.04	0.0	.007
670.....	18449	2 52.9	+34 47	5.0	K2	.06	0.2	.011
672.....	18474	2 53.0	+46 49	5.6	G4	.04	0.2	.008
674A....	18520	2 53.5	+20 56	5.9†	A4s	.02	1.1	.011
674B....	18519	2 53.5	+20 56	6.2	A4s	.02	1.2	.010
676.....	18535	2 53.6	−24 0	6.0	K2	.07	−0.3	.005
678B....	18538	2 53.7	+51 57	6.8	A1n	.04	2.2	.012
C 388.....	18702	2 55.2	+ 5 36	8.2	K1	.67	5.5	.029
684.....	18692	2 55.2	−25 40	5.6	A9n	.20	1.9	.018
C 392.....	18757	2 56.0	+61 20	6.7	G2	.98	4.6	.038
BD +59°588.....	18766	2 56.0	+59 55	7.2	F4	.05	3.0	.014
686.....	18769	2 56.0	+26 4	5.9	A7s	.01	2.0	.017
689.....	18803	2 56.5	+26 13	6.7	G6	.30	5.2	.050
691.....	18884	2 57.1	+ 3 42	2.8	M2	.08	−0.1	.026
693.....	18907	2 57.3	−28 28	5.9	G5	.49	4.8	.060
694A....	18925	2 57.6	+53 7	3.4†	cF7‡	.01	−0.3	.018
ADS 2316A....	18975	2 58.0	− 2 29	7.5	F7	.....	3.5	.016
698.....	19058	2 58.8	+38 27	3.7*	M4	.18	−0.4	.015
704.....	19270	3 0.9	+12 48	5.8	K0	.07	0.9	.010
C 404.....	19305	3 1.2	+ 1 36	8.9	M0	.95	8.5	.083
707.....	19349	3 1.6	− 6 29	5.6	M3	0.00	−0.1	.007
710.....	19373	3 1.8	+49 14	4.2	G1	1.27	3.9	.087
ADS 2356A....	19383	3 2.0	−13 42	8.0	F2	0.04	3.8	.014
C 407.....	19445	3 2.5	+25 58	8.0	A4sp*	.86	5.0	.025
C 408.....	19467	3 2.6	−14 8	7.2	G5	.28	4.8	.033
712.....	19460	3 2.7	+18 25	6.5	M0	.04	0.3	.006
713A....	19476	3 2.7	+44 29	4.3†	G8	.24	0.4	.017
BD +60°636.....	19536	3 3.5	+60 15	7.3	A3s	.01	1.4	.007
717.....	19656	3 4.8	+39 14	4.8	G9	.02	0.3	.013
718.....	19787	3 5.9	+19 21	4.5	K2	.15	0.6	.017
ADS 2409B....	19923	3 7.1	+38 46	8.2	F3	0.07	3.3	0.010

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. m	Sp.	μ	Vis. M	Spec. π
	720.....	19926	$3^h\ 7^m.1$	+ 6°17′	6.1†	cG2‡	0″.04	−0.9	0″.004
	721A....	19978	3 7.6	+77 22	5.5	A4n	.08	1.8	.018
	722A....	19994	3 7.7	− 1 34	5.1	F8	.21	3.8	.055
	723A....	20010	3 7.8	−29 23	3.9	F5	.73	3.6	.087
C	423.....	20039	3 8.2	+71 55	9.0	G4	.43	4.1	.010
BD	+59°616.....	20040	3 8.2	+59 44	7.8	Go	.01	1.2	.005
	726.....	20084	3 8.6	+84 33	6.1†	G4	.15	0.5	.008
BD	+15°450.....	20086	3 8.6	+15 12	7.3	A3n	.04	2.0	.009
ADS	2416AB..	20115	3 8.9	+ 0 22	8.8†	F8	.07	3.6	.009
	729.....	20123	3 9.1	+50 34	5.3	cG2	.02	−1.4	.005
C	427.....	20165	3 9.4	+ 8 37	7.7	K2	.58	5.9	.044
	736.....	20290	3 10.7	− 9 8	6.8	K2	.02	0.7	.006
C	431.....	.....	3 10.8	+30 40	9.7†	K5	.28	6.6	.024
	743.....	20395	3 11.7	− 9 31	6.2	F4	.05	3.5	.029
ADS	2451A....	20430	3 12.1	+ 7 17	7.4	Go	.19	3.4	.016
C	437.....	20439	3 12.2	+ 7 19	7.7	G2	.19	3.7	.016
	746.....	20468	3 12.5	+33 51	4.9	K4	.01	−0.6	.008
C	439.....	20512	3 12.9	+14 49	7.7	G4	.30	4.2	.020
	749A....	20559	3 13.3	− 1 18	5.6	Ko	.25	0.9	.011
	750A....	20610	3 13.9	−22 53	5.0	G6	.02	0.8	.014
	751.....	20618	3 14.0	+26 43	5.9	G5	.08	2.5	.021
BD	−14°646.....	20622	3 14.0	−14 37	7.9	K2	.....	−0.1	.003
	752.....	20630	3 14.1	+ 3 0	5.0	G5	.28	4.7	.087
	753A....	20631	3 14.1	−18 55	6.1†	F2	.12	3.2	.026
	755.....	20644	3 14.3	+28 41	4.7	K4	.03	−0.3	.010
	756.....	20663	3 14.5	+25 18	6.4	K3	.10	0.4	.006
	758.....	20675	3 14.8	+48 43	6.2	F5	.21	3.1	.024
	759A....	20720	3 15.1	−22 7	4.0	M3	.06	−0.6	.012
	760.....	20709	3 15.1	+72 51	7.3	K2	.07	0.5	.004
	763.....	20791	3 15.9	+ 3 19	5.8	G8	0.06	0.6	.009
	764.....	20794	3 15.9	−43 27	4.3	G7	3.14	4.9	.132
	765.....	20797	3 16.0	+64 14	5.6	K5	0.02	−1.7	.003
	768.....	20825	3 16.2	+27 15	5.6	G5	.02	0.3	.009
	769.....	20853	3 16.5	−26 58	6.4	F6	.06	2.9	.020
ADS	2499A....	20873	3 16.8	+29 28	7.8	A5s	.04	1.5	.005
	770.....	20893	3 17.0	+20 23	5.2	K5	.05	0.1	.010
	771.....	20894	3 17.0	−24 0	5.7	G3	.03	0.7	.010
	772.....	20902	3 17.2	+49 30	1.9	cF4	.04	−1.2	.024
	775.....	21017	3 18.4	+24 22	5.7	K4	.06	0.2	.008
BD	+31°597.....	21110	3 19.3	+31 23	7.5	K4	.01	−0.1	.003
	778.....	21120	3 19.4	+ 8 41	4.1†	K1	.10	0.3	.017
C	453.....	21197	3 20.1	− 5 42	8.1	K6	.82	7.3	.069
	792A....	21467	3 22.6	+22 28	6.1	G6	.11	2.7	.021
	794.....	21530	3 23.2	−11 38	5.8	K2	.06	0.4	.008
C	456.....	21531	3 23.3	−20 9	8.2	Mo	0.60	8.4	0.110

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
795.....	21552	$3^h23^m.5$	+47°39′	4.6	K4	0″.02	0.2	0″.013
804.....	21754	3 25.4	+12 36	4.6†	G7	.02	0.4	.014
805.....	21770	3 25.5	+45 43	5.4	A0s	.08	3.1	.035
BD +44°732.....	21771	3 25.5	+44 30	7.8†	cG8‡	.01	−0.7	.002
BD +29°571.....	21834	3 26.1	+29 39	8.0	A5n	.01	2.0	.006
ADS 2612A....	21903	3 26.8	+59 42	6.9†	F4	.03	3.2	.018
814.....	22049	3 28.2	− 9 48	3.8	K2	.97	6.0	.275
C 468.....	22072	3 28.4	+17 31	6.4	G7	.33	4.5	.042
822.....	22409	3 31.2	−11 32	5.7	G7	.08	0.7	.010
BD +58°632.....	22427	3 31.4	+59 7	7.1	K4	.02	0.2	.004
BD +21°489.....	22444	3 31.5	+22 1	8.9	F3	.05	3.3	.008
823A....	22468	3 31.7	+ 0 16	6.6†	G0‖	.15	5.0	.048
823B....		3 31.7	+ 0 16	8.9	K5	.15	6.6	.035
825.....	22484	3 31.8	+ 0 5	4.4	F9	.54	3.9	.079
BD +23°483.....	22491	3 31.9	+23 57	8.1	K3	.05	0.8	.003
826.....	22649	3 33.5	+62 54	5.6†	M4	.02	−0.8	.005
BD +25°584.....	22651	3 33.5	+25 49	9.0	F4	.04	2.9	.006
829A....	22695	3 33.8	+16 13	6.3	G5	.06	0.5	.007
830.....	22701	3 33.9	+86 20	5.8	F1	.17	2.3	.020
831.....	22713	3 34.1	− 5 57	6.0	K1	.20	5.3	.072
832A....	22764	3 34.5	+59 39	6.0	K5	.00	−0.7	.005
835.....	22796	3 34.6	+ 2 44	5.8	G6	.04	0.8	.010
C 489.....	22879	3 35.3	− 3 32	6.7	F6	.73	3.4	.022
BD +23°489.....	22887	3 35.5	+23 10	9.4	F0	.05	2.7	.005
840.....	23005	3 36.5	+66 53	5.8	F4	.14	2.6	.023
C 494.....	23050	3 36.9	+42 18	7.4	G0	.41	4.2	.023
BD +44°782.....	23082	3 37.2	+44 34	7.8	cK5	.03	−1.8	.001
842.....	23089	3 37.3	+63 2	5.3†	cF5	.01	−0.5	.007
ADS 2717A....	23107	3 37.4	+38 3	7.4	K4	.03	−0.2	.003
ADS 2717B....	23108	3 37.4	+38 3	8.7	A5n	.03	2.0	.005
ADS 2714A....	23133	3 37.6	+22 26	9.4†	A5n	.07	2.2	.004
BD +23°495.....	23156	3 37.8	+24 4	8.5	A0s	.05	3.0	.008
BD +23°496.....	23157	3 37.8	+23 20	8.6	F1	.03	2.9	.007
BD +23°497.....	23158	3 37.8	+23 17	10.0	F3	.06	3.4	.005
843.....	23183	3 38.0	+19 21	6.3	G6	.14	1.0	.009
C 499.....	23189	3 38.2	+68 21	9.2	M0	.30	8.1	.060
847A....	23230	3 38.4	+42 16	3.9	cF4	.01	−1.0	.010
BD +23°504.....	23246	3 38.5	+24 5	8.9	A5n	.05	2.2	.005
848.....	23249	3 38.5	−10 6	3.7	K0	.75	4.6	.151
BD +22°537.....	23289	3 39.0	+22 58	9.2	F2	.03	3.0	.006
BD +23°508.....	23325	3 39.2	+23 57	9.2	A6n	.05	2.1	.004
BD +23°517.....	23409	3 39.8	+23 44	8.3	A1n	.03	2.4	.007
859.....	23413	3 39.8	− 0 37	5.8	K5	0.05	0.3	.008
862A....	23439	3 40.2	+41 9	8.2	G7	1.40	5.5	.029
862B....		3 40.2	+41 9	8.8	K2	1.39	5.8	0.025

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
864.....	23475	$3^h40^m.4$	+65°13′	4.7	M1	0″.00	−1.5	0″.006
BD +23°523.....	23489	3 40.5	+23 57	7.0	A1n	.04	2.0	.010
BD +23°524.....	23512	3 40.7	+23 19	8.6	A2n	.06	2.3	.005
869D...	23608	3 41.3	+23 49	8.7	F3	.05	2.9	.007
869C....	23607	3 41.4	+23 50	8.1	F2	.05	1.7	.005
BD +23°535.....	23609	3 41.4	+23 25	8.0	F6	.05	3.4	.012
868.....	23614	3 41.4	−12 25	4.6	M2	.07	−0.1	.011
ADS 2766A....	23627	3 41.5	+24 21	8.4	A2n	.03	2.2	.006
BD +24°566.....	23628	3 41.5	+24 17	7.3	A1n	.05	2.1	.009
BD +23°537.....	23632	3 41.5	+23 30	6.8	A1n	.03	2.0	.011
BD +23°539.....	23643	3 41.5	+23 22	8.1	A3n	.03	2.0	.006
BD +23°542.....	23654	3 41.7	+23 18	8.3	K0	.09	0.3	.003
873.....	23754	3 42.5	−23 33	4.3	F3	.55	3.3	.063
BD +23°553.....	23763	3 42.6	+24 2	6.6	A1n	.05	1.8	.011
ADS 2782A....	23778	3 42.6	+23 52	9.8†	F4	.05	3.2	.005
BD +21°530.....	23792	3 42.8	+21 37	8.3	A6n	.06	1.7	.005
XY Persei*.....	.....	3 43.0	+38 41	11.0†	A3s	.02	1.0	.001
876.....	23838	3 43.1	+44 40	5.8	G0	.04	1.5	.014
BD +23°560.....	23872	3 43.3	+24 5	8.1	A2n	.05	2.3	.007
BD +23°562.....	23886	3 43.5	+23 57	7.9	A2n	.04	2.1	.007
BD +22°570.....	23912	3 43.6	+23 5	8.9	A7n	.04	2.0	.004
881.....	23940	3 43.9	−30 28	5.6	G5	.24	1.3	.014
BD +23°567.....	23948	3 44.0	+24 3	7.3	A1n	.05	2.2	.010
BD +23°565.....	23949	3 44.0	+23 55	8.9	A2n	.01	2.4	.005
C 513.....	24002	3 44.4	+ 1 4	8.6	K3	.67	6.6	.040
BD +23°570.....	24076	3 45.0	+23 40	6.8	A1n	.03	1.9	.010
BD +24°584.....	24132	3 45.5	+24 13	9.2	A6n	.05	2.1	.004
C 518.....	24206	3 46.2	+22 23	7.8	G5	.39	4.9	.026
C 521.....	24238	3 46.4	+60 53	7.8	K1	.48	5.7	.038
889.....	24240	3 46.4	+48 21	5.9	K2	.06	0.2	.007
BD +24°589.....	24302	3 46.9	+24 23	9.2	F5	.08	3.3	.007
892.....	24357	3 47.4	+17 2	6.0	F1	.15	2.5	.020
895.....	24451	3 48.4	+75 53	8.3	K6	.65	7.3	.063
897A....	24480	3 48.6	+60 49	5.3†	K4	.02	−0.4	.007
900A....	24546	3 49.2	+50 24	6.0†	F4	.16	2.9	.024
ADS 2849A....	24550	3 49.2	+ 4 54	7.6	A9n	.04	1.3	.005
901A....	24555	3 49.3	− 3 15	5.0	G4	.04	0.9	.015
901B....	24554	3 49.3	− 3 15	6.3	A1n	.04	2.0	.014
908.....	24740	3 51.0	+22 11	5.8	F3	.13	2.8	.025
912.....	24834	3 51.8	−13 53	6.7	M3	.01	−0.8	.003
BD +38°827.....	24843	3 51.9	+38 33	6.4	K1	.06	0.3	.006
BD + 1°685.....	25001	3 53.2	+ 1 10	7.9	K1	.01	0.4	.003
914A....	25007	3 53.3	+80 25	5.6†	F1*	.02	3.4	.036
915A....	25025	3 53.4	−13 48	3.2	M0	.13	−0.4	.019
BD +53°722.....	25056	3 53.8	+53 35	7.4	cG2	0.04	−2.0	0.001

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
BD + 9°524.....	25102	3^h54^m2	+10° 2′	6.4	F3	0″.17	3.5	0″.026
916.....	25165	3 54.8	−12 51	5.9	K5	.03	0.1	.007
C 540.....	25173	3 55.0	+74 54	7.3	F5	.34	3.8	.020
919.....	25202	3 55.0	+17 55	6.3†	A9n	.14	2.4	.017
921.....	25230	3 55.3	+19 55	6.8	G4	0.08	1.2	.008
927.....	25329	3 56.5	+35 2	8.6	Ko	2.20	5.7	.026
ADS 2959A....	25444	3 57.4	+39 14	7.4†	G5	0.20	4.5	.026
931.....	25457	3 57.5	− 0 32	5.4	F7	.29	3.8	.048
933A....	25555	3 58.4	+23 50	6.2†	F4‡	.02	2.9	.022
935.....	25570	3 58.5	+ 7 55	5.5	F2	.16	2.8	.029
936.....	25604	3 58.8	+21 49	4.5	Ko	.11	0.8	.018
937.....	25621	3 58.9	+ 2 33	5.4	F5	.19	3.2	.036
C 546.....	25665	3 59.2	+69 17	8.1	K2	.31	6.3	.044
939.....	25680	3 59.4	+21 44	6.0	G1	.22	5.1	.066
942.....	25723	3 59.7	−13 4	5.7	Ko	.01	0.6	.010
944.....	25867	4 0.8	+28 44	5.3	F1	.08	3.1	.036
BD +52°771.....	25878	4 0.9	+53 6	7.1	cG1e*	.01	−3.0	.001
945A....	25893	4 0.9	+37 49	7.3†	K2	.29	5.5	.044
949.....	25975	4 1.6	+37 28	6.2	K1	.21	1.2	.010
950.....	25998	4 1.9	+37 47	5.6	F7	.26	3.6	.040
ADS 2999A....	26015	4 2.0	+14 54	6.0†	F5	.13	2.9	.024
C 553.....	26018	4 2.1	+76 2	8.2	K1	.25	5.9	.035
C 554.....	.....	4 2.2	−21 6	9.7	Mo	.79	8.1	.048
951A....	26038	4 2.3	+17 4	6.2†	K5	.02	0.4	.007
BD +75°167.....	26047	4 2.4	+75 34	8.6	F1	.00	2.9	.007
952.....	26162	4 3.3	+19 21	5.7	K1	.11	0.4	.009
955.....	26322	4 4.7	+26 13	5.6	F3	.05	2.9	.029
958.....	26367	4 5.1	+85 17	6.7	F8	.04	3.2	.020
960.....	26409	4 5.5	− 7 11	5.6	G6	.01	0.8	.011
961.....	26462	4 6.0	+ 5 16	6.0†	F4	.14	2.7	.022
963.....	26574	4 7.0	− 7 6	4.1	F1	.08	2.1	.040
967.....	26630	4 7.6	+48 9	4.6†	cG2	.03	−2.0	.005
968.....	26659	4 8.0	+83 6	5.7	G4	.12	1.0	.011
970.....	26673	4 8.1	+40 14	5.2†	cG3‡	.03	−0.9	.006
971AB..	26690	4 8.2	+ 7 28	6.0†	Fo	.00	2.6	.021
BD +27°649.....	26709	4 8.4	+27 42	8.1	A8s	.04	2.0	.006
972A....	26722	4 8.5	+ 9 1	5.1†	G5	.04	0.0	.010
C 560.....	.....	4 8.6	+22 6	8.9	A8s	.54	3.0	.007
973.....	26755	4 8.8	+57 37	5.8	K2	.05	0.6	.009
977.....	26836	4 9.6	+80 35	5.6	G6	.02	0.3	.009
ADS 3082AB..	26842	4 9.6	+31 27	8.1†	Go	*	3.9	.014
978A....	26846	4 9.6	−10 30	5.1	K2	.16	0.4	.011
980.....	26911	4 10.1	+15 9	6.4	F2	0.12	2.7	.018
984A....	26965	4 10.7	− 7 49	4.5	Ko	4.08	6.0	.200
984C....	.....	4 10.8	− 7 49	11.3	M5e	4.08	12.7	0.191

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	988.....	27022	$4^h11^m.3$	+64°54′	5.4	G3	0″.02	0.9	0″.013
C	570.....	27130	4 11.9	+16 42	8.6†	G5	.11	4.7	.017
	991.....	27176	4 12.5	+21 20	5.6	A7n	.11	2.1	.020
BD	+15°609.....	.....	4 12.7	+15 51	9.2	K4	.10	6.7	.032
	993.....	27245	4 13.1	+60 30	5.7	Mo	.12	−0.4	.006
BD	−14°866.....	27325	4 13.7	−14 53	6.9	G6	.....	0.3	.005
	999.....	27348	4 13.9	+34 20	5.1	G9	.03	0.6	.013
BD	+23°675.....	27370	4 14.1	+23 21	7.5	G5	.12	1.7	.007
	1000.....	27371	4 14.1	+15 23	4.2†	Ko	.12	0.6	.019
	1002A....	27382	4 14.2	+27 7	5.1	K1	.09	0.5	.012
ADS	3135A....	27383	4 14.2	+16 17	7.1†	F6	.11	3.8	.022
	1004.....	27397	4 14.3	+13 48	6.1†	A9n	.12	2.4	.018
BD	+18°623.....	27406	4 14.4	+19 0	7.7	F8	.13	4.0	.018
BD	+18°624.....	27429	4 14.6	+18 29	6.5†	F2	.12	3.0	.020
	1007.....	27459	4 14.9	+14 51	5.8†	A7n	.12	1.8	.016
BD	+13°665.....	27483	4 15.2	+13 38	6.8†	F2‖	.09	3.0	.017
	1008.....	27497	4 15.4	+ 5 54	5.9	G6	.05	0.7	.009
	1009.....	27518	4 15.5	−25 16	6.9	K5	.02	0.0	.004
BD	+20°740.....	27524	4 15.6	+20 49	6.9	F2	.09	3.4	.020
C	575.....	27534	4 15.7	+18 11	6.7	F5	.12	3.1	.019
	1013.....	27628	4 16.4	+13 50	6.1†	A9s	.12	2.0	.015
	1014A....	27639	4 16.5	+20 35	6.8†	Mo	.01	−0.3	.004
	1015A....	27638	4 16.5	+25 24	5.4	A0n	.04	2.1	.022
	1015B....	.....	4 16.5	+25 24	8.3	F8	.04	3.1	.009
ADS	3169A....	27691	4 17.1	+14 49	7.6†	F8	.11	3.7	.017
ADS	3169B....	.....	4 17.1	+14 49	8.7	G1	.11	4.4	.014
	1017.....	27697	4 17.2	+17 18	3.9	G8	.12	0.6	.022
ADS	3159AB..	27710	4 17.4	−25 58	6.6†	F2	.07	3.2	.021
	1018.....	27749	4 17.7	+16 33	6.0†	A7s	.11	2.0	.016
C	580.....	27757	4 17.8	+77 24	7.8	F9	.24	4.5	.022
	1021A....	27786	4 18.1	+33 44	5.9†	F5	.05	2.8	.024
	1022.....	27819	4 18.3	+17 13	5.1†	A9n	.12	2.1	.025
BD	+16°591.....	27848	4 18.6	+16 50	7.8	F3	.10	3.8	.016
C	582.....	27859	4 18.7	+16 39	8.0	F9	.13	4.4	.019
	1025.....	27901	4 19.1	+18 49	6.0	A9n	.12	2.5	.020
	1026(A)..	27934	4 19.4	+22 4	4.4	A5n	.11	2.0	.033
	1027(B)..	27946	4 19.5	+21 58	5.4	A5n	.13	2.0	.021
	1029A....	27962	4 19.7	+17 42	4.2	A4s	.11	1.2	.025
	1030.....	27971	4 19.7	+31 13	5.3	G6	.14	0.9	.013
	1031.....	27991	4 19.9	+15 43	6.4	F5	.11	3.0	.021
ADS	3210A....	27989	4 20.0	+18 38	8.2†	G5	.12	4.8	.021
C	585.....	28005	4 20.1	+46 38	6.7	G2	.32	4.1	.030
	1033.....	28024	4 20.3	+22 35	4.9†	A3n	.12	2.0	.026
BD	+21°644.....	28033	4 20.4	+21 14	7.5	F9	.10	3.4	.015
C	586.....	28034	4 20.4	+15 18	7.4	F7	0.12	3.8	0.019

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
1034A....	28052	4^h20^m6	+15°23′	5.1†	A3n‖	0″.12	2.0	0″.024
BD + 4°690.....	28069	4 20.7	+ 4 54	7.2	F7	.09	3.6	.019
BD +16°601.....	28099	4 20.9	+16 31	8.0	G4	.10	4.7	.022
1036.....	28100	4 21.0	+14 29	4.9	G6	.04	0.0	.010
1037A....	28139	4 21.2	+18 54	7.7	F5	.16	3.4	.014
BD +15°627.....	28205	4 21.9	+15 22	8.0	F8	.10	4.2	.017
1040.....	28226	4 22.1	+21 24	5.7	A8n	.12	2.0	.018
BD +14°699.....	.....	4 22.1	+14 12	9.6	K4	.07	6.6	.025
ADS 3243A....	28271	4 22.5	+30 9	6.3	F4	.03	3.0	.022
1042.....	28292	4 22.7	+16 8	5.3	K1	.02	0.5	.011
1043.....	28294	4 22.7	+14 31	6.3†	A0n	.11	2.4	.017
1044.....	28305	4 22.8	+18 58	3.6	G7	.12	0.7	.026
1045(B)..	28307	4 23.0	+15 44	4.3†	G8	.11	1.0	.022
1046(A)..	28319	4 23.0	+15 39	4.3†	A7s‖	.11	1.1	.023
BD +16°606.....	28344	4 23.1	+17 3	7.6	G1	.11	4.0	.019
1047.....	28355	4 23.2	+12 50	5.1	A6n	.11	1.7	.021
ADS 3248A....	28363	4 23.3	+15 57	7.0†	F8	.13	3.7	.022
BD +13°688.....	28424	4 23.9	+13 41	7.8	G9	.16	0.6	.004
BD +19°731.....	28483	4 24.4	+19 37	7.2	F5	.08	3.5	.018
1051A....	28485	4 24.4	+15 25	6.3†	A6n	.11	2.2	.015
1054.....	28527	4 24.8	+15 59	5.4†	A8n‖	.12	1.9	.020
1055.....	28546	4 24.9	+15 28	5.5	F1	.11	2.3	.023
1056.....	28556	4 25.0	+13 30	5.5	F1	.11	2.3	.023
BD +15°640.....	28568	4 25.1	+15 56	6.7	F1	.11	3.1	.019
BD +29°716.....	28592	4 25.3	+29 41	8.4	A0n	.05	1.3	.004
1057.....	28595	4 25.4	+14 53	6.6	M3	.07	−0.6	.004
BD +10°588.....	28608	4 25.5	+10 32	7.1	F7	.12	3.4	.018
1058.....	28677	4 26.1	+15 38	6.3†	A0n	.11	2.3	.016
1060.....	28693	4 26.3	+42 49	6.8	A8s	.08	1.8	.010
1061.....	28704	4 26.4	+42 51	6.1	F1	.01	2.3	.017
BD + 5°674.....	28736	4 26.7	+ 5 11	6.4	F4	.08	3.6	.027
1063.....	28749	4 26.8	− 0 16	5.0	K4	.00	−0.2	.009
BD +15°647.....	28805	4 27.3	+15 36	8.5	G6	.12	5.3	.023
20C 296.....	.....	4 27.9	+55 13	8.0	K4	.64	6.7	.055
BD +14°721.....	.....	4 28.2	+14 57	8.4	K2	.10	6.0	.033
1067.....	28910	4 28.2	+14 38	5.3†	A5n‖	.10	1.9	.021
BD +12°608.....	28911	4 28.2	+13 2	6.7	F5	.11	3.4	.022
BD +14°722.....	.....	4 28.6	+14 46	8.6	K5	.07	0.2	.002
C 593.....	29038	4 29.2	+16 47	7.7†	K4	.11	0.8	.004
1071.....	29064	4 29.4	− 8 26	5.4	M3	.04	−0.7	.006
1072.....	29065	4 29.4	− 9 11	5.5	K5	.12	0.1	.008
1073.....	29085	4 29.6	−29 58	4.6	G6	.29	0.8	.017
C 594.....	232979	4 29.8	+52 42	8.5	M1	.53	8.8	.115
1074.....	29094	4 29.8	+41 4	4.8†	cG2‡	.02	−1.3	.006
BD +19°740.....	29103	4 29.8	+19 46	7.2	F8	0.03	3.7	0.020

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. m	Sp.	μ	Vis. M	Spec. π
1077A....	29139	4^h30^m2	+16°18′	1.1	K5	0″.20	0.0	0″.060
C 596.....	29169	4 30.5	+23 9	6.0	F2	.13	3.4	.030
BD +15°656.....	29225	4 31.0	+15 40	6.7	F5	.08	3.3	.021
ADS 3338A....	29235	4 31.1	+41 55	7.6†	K2	.06	0.9	.005
BD +14°728.....	29310	4 31.9	+14 57	7.8	Go	.12	3.8	.016
1082A....	29317	4 32.0	+52 53	5.6†	G6	.02	0.2	.008
1083A....	29316	4 32.0	+53 17	5.7†	A5n	.11	2.2	.020
ADS 3353A....	29364	4 32.3	+26 44	7.2†	F3	.06	3.2	.016
ADS 3353B....	.....	4 32.3	+26 44	7.2	Fo	.06	3.3	.017
1086.....	29375	4 32.4	+15 50	5.8	A5n	.09	2.2	.019
1087.....	29388	4 32.6	+12 19	4.9†	A4n‖	.10	1.8	.024
BD +66°343.....	29400	4 32.8	+66 32	8.5	G5	.38	4.8	.018
1089(B)..	29479	4 33.4	+15 36	5.2	A5s	.07	1.8	.021
1090(A)..	29488	4 33.6	+15 43	5.3†	A5n‖	.08	2.0	.022
1091.....	29503	4 33.6	−14 30	4.3†	K3	.18	1.0	.022
1092.....	29499	4 33.7	+ 7 40	5.9†	A7s	.08	2.0	.017
1095.....	29573	4 34.2	−12 19	5.0	A4s	.05	1.5	.020
BD +30°704.....	29581	4 34.4	+30 7	8.1	F5	.05	3.4	.011
C 602.....	29587	4 34.5	+41 56	7.3	G2	.69	4.5	.027
1098.....	29613	4 34.7	−14 33	5.6	K1	.19	2.2	.021
1100.....	29678	4 35.4	+75 46	6.3†	A6n	.14	1.9	.013
1104.....	29737	4 36.0	−24 41	5.9†	G6	.07	1.0	.010
1105.....	29755	4 36.1	−19 52	4.5	M4	.09	−0.1	.012
1109.....	29859	4 37.2	+23 54	6.2	F6	.03	3.2	.025
BD +15°670.....	29884	4 37.4	+15 18	8.1	A5n	.03	1.5	.005
1112(B)..	30020	4 38.8	− 8 59	7.0	F3	.04	2.4	.012
1113(A)..	30021	4 38.8	− 8 59	7.0†	G6	.04	0.8	.006
1114.....	30034	4 38.9	+10 58	5.4	A6s	.10	1.9	.020
ADS 3417A....	30101	4 39.5	+ 5 6	9.0†	G7	.16	5.5	.020
ADS 3417B....	.....	4 39.5	+ 5 6	9.0	K1	.13	5.8	.023
1120.....	30197	4 40.4	+18 33	6.1	K4	.09	0.2	.007
1122.....	30210	4 40.5	+11 31	5.7†	A7s	.07	1.7	.016
BD + 8°759.....	30311	4 41.3	+ 8 50	7.2	F8	.11	3.8	.021
1124.....	30338	4 41.6	+81 2	5.3	K4	.03	0.3	.010
1128.....	30442	4 42.7	+63 20	5.8	M2	.11	−0.1	.007
1129.....	30454	4 42.8	+31 16	5.8	K1	.11	0.7	.010
1131.....	30455	4 42.8	+18 33	7.1†	G1	.44	4.6	.032
1132.....	30495	4 43.1	−17 7	5.6	G1	.22	4.4	.057
1133.....	30504	4 43.2	+37 19	5.1	K4	.05	0.4	.011
1134.....	30557	4 43.6	+48 34	5.8	Ko	.06	0.9	.010
BD +15°686.....	30589	4 43.8	+15 43	7.9	F9	.10	4.0	.017
1136.....	30605	4 44.0	+15 44	6.3	K3	.02	−0.3	.005
1137.....	30606	4 44.0	−16 30	6.0	F6	.05	3.5	.032
C 618.....	30604	4 44.1	+70 28	8.6	G1	.28	4.2	.013
C 619.....	30649	4 44.4	+45 41	7.1	F9	0.68	3.6	0.020

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
1140.....	30652	$4^h44^m.4$	+ 6°47′	3.3	F5	0″.47	3.5	0″.110
BD +15° 692.....	30738	4 45.1	+16 3	7.3	F8	.10	3.7	.019
1143.....	30780	4 45.5	+18 40	5.6†	A4n	.09	2.3	.022
BD − 0° 785.....	30812	4 45.7	− 0 16	7.4	Ko	.07	0.6	.004
ADS 3475AB..	30810	4 45.7	+10 54	7.7†	F7	.10	3.7	.016
1145.....	30814	4 45.7	−16 23	5.2	G9	.08	0.1	.010
1148.....	30834	4 45.9	+36 32	5.0	K3	.03	0.3	.011
ADS 3483A....	30869	4 46.2	+13 29	6.8†	F5	.13	3.3	.020
1149.....	30959	4 46.9	+14 5	5.2	M4	.06	−0.6	.007
BD +41°1002.....	31085	4 47.8	+41 36	8.0	F5	.02	2.5	.008
1153.....	31109	4 48.0	− 5 37	4.4	A4n	.03	2.0	.033
1154.....	31139	4 48.2	+ 2 21	5.7	M1	.03	−0.2	.007
ADS 3514A....	31208	4 48.8	+ 7 13	7.9	K2	.30	5.7	.036
ADS 3514B....	.....	4 48.8	+ 7 13	8.2	K1	.30	5.4	.027
BD +19° 811.....	31236	4 49.0	+19 20	6.2	Fo	.12	2.8	.021
1162.....	31296	4 49.4	+ 7 37	5.5	K1	.03	0.4	.010
1164.....	31312	4 49.6	+74 7	6.2	K4	.05	−0.2	.005
1167.....	31398	4 50.5	+33 0	2.9	K3	.03	−0.5	.021
1168.....	31414	4 50.6	−16 54	5.8	G9	.00	0.9	.010
1169A....	31421	4 50.7	+13 21	4.3	K2	.10	0.3	.016
1170.....	31444	4 50.8	−16 35	5.8	G4	.06	1.2	.012
C 634.....	31501	4 51.3	+34 7	8.0	G8	.60	5.2	.027
1171.....	31517	4 51.4	−25 53	6.6	Fo	.03	2.3	.014
1174.....	31539	4 51.6	+17 0	5.7	K1	.02	0.3	.008
1175A....	31553	4 51.7	+23 48	6.0	G8	.03	0.5	.008
1176.....	31579	4 51.8	+53 0	6.4	K3	.01	0.5	.007
1178B....	.....	4 52.5	+37 44	8.9	F9	.12	3.9	.010
1179.....	31675	4 52.7	+66 41	6.3	F6	.36	3.5	.027
1181.....	31767	4 53.4	+ 1 34	4.7	cK3	.01	−0.7	.008
1182A....	31761	4 53.4	+39 15	6.0	F3	.01	3.1	.026
1183.....	31780	4 53.5	+39 30	6.7	K5	.01	0.0	.005
ADS 3593A....	31796	4 53.6	+50 6	9.5†	F4	.12	3.0	.005
1184.....	31845	4 54.0	+15 46	6.7	F2	.10	3.4	.022
βGC 2451A....	31865	4 54.2	+62 57	8.6	G4	.34	4.6	.016
βGC 2451B....	31864	4 54.2	+62 57	8.6	G5	.34	4.9	.018
1185A....	31910	4 54.5	+60 18	4.2	cG2	.01	−2.5	.005
1186A....	31925	4 54.5	−16 32	5.7†	F2	.23	3.2	.032
1187A*...	31964	4 54.8	+43 41	3.3†	cF2	.01	−1.7	.010
1188.....	32008	4 55.1	−10 25	5.7	G4	.13	3.9	.044
1190.....	32068	4 55.5	+40 56	4.4†	cK4‡	.03	−2.5	.004
C 646.....	32070	4 55.5	+24 30	8.5	G3	0.32	4.6	.017
C 648.....	32147	4 55.9	− 5 52	6.5	K5	1.25	6.8	.115
1196(B)..	32357	4 57.5	+58 53	6.4	G5	0.04	0.3	.006
1198.....	32436	4 58.1	−26 25	5.0	Ko	.12	0.7	.014
1200.....	32503	4 58.5	−22 56	5.8	K1	0.07	0.5	0.009

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
1202A....	32537	4^h58^m8	+51°28′	5.0	F3	0″.18	2.5	0″.032
C 654.....	32715	5 0.0	+64 48	6.4	F3	.19	3.4	.025
1210.....	32890	5 1.2	−26 17	5.9	K2	.07	0.8	.010
1211.....	32887	5 1.2	−22 30	3.3	K5	.07	0.3	.025
1212AB..	32923	5 1.5	+18 31	5.7†	G1	.51	4.0	.046
BD +42°1180.....	.....	5 1.7	+42 27	9.2†	M6	.05	−0.2	.001
1217.....	33021	5 2.2	+ 9 21	6.3	G2	.38	3.9	.033
1219A....	33054	5 2.4	+ 8 22	6.7†	F2‡	.07	2.6	.015
1220.....	33111	5 2.9	− 5 13	2.9	A2n	.12	1.9	.063
1221.....	33121	5 2.9	+19 44	6.6	G4	.02	0.7	.007
1222.....	33167	5 3.3	+46 50	5.6	F3	.17	2.8	.027
ADS 3730A....	33204	5 3.5	+27 55	6.0	Fo	.01	2.5	.020
1224.....	33256	5 3.8	− 4 35	5.2	F1	.04	3.1	.038
1226.....	33254	5 3.8	+ 9 42	5.4	A9s	.07	1.8	.019
1227.....	33276	5 4.0	+15 28	4.9	Fo	.01	1.6	.022
1232.....	33473	5 5.3	−41 21	6.6	G2	.30	4.0	.030
1234.....	33554	5 5.9	+15 55	5.4	K5	.00	0.5	.010
1235A....	33564	5 6.1	+79 7	5.2	F4	.17	3.3	.042
BD +37°1091.....	33632	5 6.5	+37 14	6.5	F6	.22	4.4	.038
1237.....	33664	5 6.7	−11 58	5.9	M6	.05	−0.8	.005
C 674.....	33725	5 7.1	− 9 13	8.0	K1	.57	5.9	.038
1240A....	33856	5 8.1	+ 2 45	4.9†	K3	.02	−0.3	.009
BD +60° 870.....	33924	5 8.6	+60 3	7.2	F3	.14	3.2	.016
1244A....	33959	5 8.9	+32 34	5.4†	A7s	.02	1.4	.016
1244C....	.....	5 8.9	+32 34	8.4†	F4	.02	3.5	.010
1246A....	34029	5 9.3	+45 54	0.7†	G1	.44	0.1	.076
1247.....	34043	5 9.4	+ 5 2	5.8	K4	.02	0.1	.007
ADS 3835A....	34052	5 9.4	+29 21	9.0	G3	.05	3.6	.008
Comp. 1246.....	.....	5 10.0	+45 44	10.5	M2	.44	9.5	.063
1255.....	34255	5 11.0	+62 33	5.9	cK4	.03	−1.5	.003
1256.....	34269	5 11.1	+42 41	5.9	M4	.05	−0.6	.005
ADS 3866A....	34335	5 11.5	+20 1	7.5†	F4‖	.08	3.5	.016
1258A....	34334	5 11.6	+33 16	5.1†	K3	.19	0.4	.011
1259A....	34411	5 12.1	+40 1	4.8	Go	.84	4.4	.083
BD +41°1154.....	.....	5 12.8	+41 8	8.6	K3	.....	0.4	.002
1263.....	34538	5 13.1	−13 38	5.7	G9	.05	2.3	.021
1264.....	34531	5 13.1	+78 13	6.8	F4	.08	2.5	.014
1266.....	34559	5 13.3	+22 0	5.1	G5	.09	0.9	.014
1267A....	34579	5 13.3	+20 2	6.2	G8	.05	0.8	.008
1270.....	34642	5 13.9	−35 0	4.9	Ko	.36	2.3	.030
1271.....	34658	5 14.0	+ 2 30	5.4	F3	.06	2.2	.023
1272.....	34653	5 14.0	+77 53	6.5	A4n	.02	1.8	.011
ADS 3900A....	34673	5 14.1	− 3 11	7.9	K5	.72	6.8	.060
BD −14°1094.....	34796	5 14.9	−14 52	8.2	F4	.....	3.4	.011
1286.....	35067	5 16.8	+ 3 28	7.7	M1	c.01	0.1	0.003

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
1290A....	35162	$5^h17^m.7$	−24°52′	5.4	G2	0″.03	1.2	0″.014
1292A....	35186	5 17.8	+37 18	5.2	K5	.03	0.3	.010
1294A....	35296	5 18.6	+17 17	5.1	F8	.24	3.7	.052
1299.....	35369	5 19.1	− 7 54	4.2	G9	.04	0.7	.020
1300.....	35410	5 19.4	− 0 59	5.2	K0	.12	0.8	.013
1309.....	35583	5 20.7	+62 59	5.8	M1	.00	−0.4	.006
BD +29° 897.....	35601	5 20.8	+29 50	8.0	M0	.02	−2.5	.001
1311.....	35620	5 21.0	+34 23	5.3	K5	.06	0.4	.010
1316A....	35736	5 21.7	−19 47	5.8	F4	.03	2.7	.024
C 693.....	35783	5 22.2	+78 18	7.7	F3	.26	3.6	.015
1319.....	35850	5 22.4	−11 59	6.4	F7	.06	3.4	.025
ADS 4099A....	35961	5 23.3	+54 35	7.6	G1	.42	4.7	.026
ADS 4099B....	.....	5 23.3	+54 35	9.7	K3	.41	6.1	.019
BD +29° 909.....	35984	5 23.4	+29 7	6.2	F2	.06	2.7	.020
C 699.....	36003	5 23.5	− 3 34	7.8	K6	.84	7.4	.083
ADS 4086A....	36044	5 23.8	+29 29	7.2	G6	.02	1.2	.006
1323A....	36079	5 24.0	−20 50	3.0	G1	.09	0.5	.032
1324.....	36066	5 24.0	+57 9	6.5	F7	.26	3.7	.027
1327A....	36167	5 24.7	− 1 10	5.0	M0	.03	−0.1	.010
BD +29° 921.....	36281	5 25.5	+29 22	8.6	G8	.03	4.8	.017
BD +29° 923.....	36335	5 25.9	+29 7	7.8	A7s	.06	2.6	.009
1334.....	36384	5 26.3	+74 59	6.4	M0	.02	0.1	.005
1335.....	36389	5 26.3	+18 31	4.7	M2	0.01	−3.2	.003
C 705.....	36395	5 26.4	− 3 42	8.1	M3	2.22	10.1	.251
C 706.....	36443	5 26.6	+ 0 2	8.4	G5	0.52	5.2	.023
1347A....	36673	5 28.3	−17 54	2.7	cF3	.00	−0.9	.019
1348.....	36678	5 28.4	+54 22	6.0	M0	.01	−0.1	.006
1350.....	36719	5 28.7	+47 39	6.0	F0	.03	2.3	.018
1360.....	36905	5 29.9	+85 9	6.4	M0	.02	0.1	.005
BD +43°1315.....	36947	5 30.1	+44 1	7.4	G0	.01	1.1	.005
C 709.....	37008	5 30.4	+51 23	7.9	K2	.56	5.6	.035
ADS 4200A....	37013	5 30.4	+21 56	7.2†	F7	.06	3.6	.019
ADS 4200B....	.....	5 30.4	+21 56	7.7	F6	.09	3.6	.015
1367.....	37070	5 30.7	+56 18	7.2†	F5	.14	2.9	.014
1368A....	37077	5 30.7	− 4 55	5.3	A9s	.01	1.5	.017
1373.....	37160	5 31.4	+ 9 14	4.4	G6	.32	2.5	.042
1378AB..	37269	5 32.2	+30 26	6.1†	F0	.02	3.3	.027
BD +42°1362.....	37283	5 32.3	+42 37	7.4	K4	.04	0.1	.003
1380.....	37289	5 32.4	+65 39	5.8	K5	.02	0.5	.009
1385.....	37394	5 33.2	+53 26	6.4	K1	.51	5.6	.069
C 714.....	37393	5 33.3	+74 34	7.3	G2	.24	4.5	.027
1390.....	37495	5 33.8	−28 45	5.3	F4	.06	2.4	.026
1393.....	37601	5 34.5	+56 32	6.2	G9	.04	2.3	.017
BD +85° 81.....	37599	5 34.6	+85 16	7.6	K1	.01	0.3	.003
ADS 4256A....	37603	5 34.6	+15 18	6.7	F0	0.02	1.6	0.010

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
1394.....	37638	5^h34^m9	+61°26′	6.4	G5	0″.00	0.8	0″.008
BD +44°1270.....	37736	5 35.7	+44 48	7.7	A5n	.02	1.8	.007
BD +43°1332.....	.....	5 36.3	+43 27	9.2	M1	.00	−0.6	.001
BD +43°1338.....	37937	5 37.0	+43 31	7.7	K1	.03	1.0	.005
1406.....	37981	5 37.3	+14 8	6.9	K1	.04	2.0	.010
1407.....	37984	5 37.3	+ 1 26	5.2	K1	.06	0.2	.010
C 724.....	38014	5 37.5	+ 2 39	8.8	K4	.55	6.2	.030
BD +42°1387.....	38130	5 38.4	+42 49	8.0	K4	.01	0.1	.003
1415A.....	38182	5 38.8	+15 1	7.5†	Go	.02	0.4	.004
C 725.....	38230	5 39.2	+37 15	7.3	K1	.71	5.4	.042
1419(B)..	38392	5 40.3	−22 27	6.4	K6	.46	6.8	.120
1420(A)..	38393	5 40.3	−22 29	3.8	F6	.46	3.8	.100
1424.....	38558	5 41.6	+17 41	5.5	F4	.01	1.7	.017
1425A.....	38584	5 41.8	+24 39	7.2	K4	.03	−0.1	.003
1426.....	38604	5 41.9	+39 30	6.9	G1	.02	1.4	.008
1427A.....	38618	5 42.0	+56 53	6.4	A2n	.01	1.9	.013
1429A.....	38656	5 42.2	+39 9	4.6	G5	.04	0.6	.016
BD +29°1004.....	38688	5 42.5	+29 43	8.2	F4	.03	2.5	.007
1433AB..	38710	5 42.6	+ 6 25	6.0†	A5n	.02	1.6	.013
BD +29°1009.....	38749	5 42.9	+29 41	7.8	A6s	.02	1.0	.004
1434.....	38751	5 42.9	+24 32	5.0	K3	.04	0.5	.013
1436.....	38827	5 43.4	−27 10	7.2	F7	.03	3.4	.017
1439.....	38944	5 44.2	+37 17	5.0	M1	.05	0.1	.010
BD +27° 887.....	38998	5 44.5	+27 39	7.7	M5	.05	0.1	.003
1441.....	39007	5 44.5	+ 9 50	5.9	G3	.01	0.9	.010
1442A.....	39003	5 44.6	+39 7	4.2	K1	.01	0.6	.019
1444.....	39004	5 44.7	+27 56	5.6	G7	.01	0.2	.008
1445.....	39019	5 44.8	+14 17	5.7	G9	.04	0.6	.010
1447A.....	39070	5 45.1	−14 31	5.6	G6	.05	0.9	.011
1450.....	39099	5 45.2	+14 1	6.8	Ko	.02	0.9	.007
ADS 4442A.....	39169	5 45.6	− 1 27	8.0†	Ko	.03	2.1	.007
Messier 37 Br.....	.....	5 45.7	+32 31	9.7	M1	.01	−0.4	.001
1456.....	39364	5 47.0	−20 53	3.9	G7	.70	3.4	.079
1458A.....	39400	5 47.2	+ 1 50	5.0	cK2	.01	−1.5	.005
1459.....	39425	5 47.4	−35 48	3.2	K1	.40	0.8	.033
1461.....	39587	5 48.5	+20 15	4.6	F9	.21	4.0	.076
1468A.....	39801	5 49.8	+ 7 23	0.9	M2	.03	−4.0	.010
1470.....	39853	5 50.1	−11 48	5.8	K4	.06	−0.4	.006
BD +81° 201.....	39861	5 50.2	+81 31	8.9	G5	.38	4.0	.010
ADS 4519A.....	39881	5 50.3	+13 56	6.5	Go	.63	4.6	.042
BD +26°1011.....	40002	5 51.1	+26 51	8.0	K2	.01	0.4	.003
1472.....	40035	5 51.3	+54 17	3.9	G6	.15	0.8	.024
1476.....	40136	5 51.9	−14 11	3.8	F2	.14	2.8	.063
1478A.....	40183	5 52.2	+44 56	2.8†	A2n‖	.05	1.8	.063
1479.....	40239	5 52.5	+45 56	4.6	M3	0.01	−1.3	0.007

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	1482A	40312	5^h52^m9	+37°12′	2.7	A1sp*	0″.10	0.7	0″.040
	1483A	40325	5 53.0	+44 35	6.4	K2	.05	0.5	.007
	1485A	40369	5 53.3	+12 48	6.5†	G4‡	.04	0.4	.006
	1491	40535	5 54.3	− 9 23	6.3	F2	.01	2.4	.017
	1494	40657	5 55.1	− 3 5	4.7	K2	.08	0.5	.014
C	748	40708	5 55.6	+67 39	8.8	G5	.34	5.0	.017
	1498	40801	5 56.1	+42 55	6.1	G8	.19	1.0	.010
C	750	40832	5 56.4	+32 38	6.2	F5	.23	3.2	.025
ADS	4629A	40959	5 57.2	+27 39	8.8	G5	.04	2.4	.005
ADS	4629B	.....	5 57.2	+27 39	9.3	A7n	.....	2.4	.004
C	756	250792	5 57.3	+19 23	9.2	F8	.93	3.5	.007
	1506	41074	5 57.9	+42 59	5.9	A8n	.15	2.2	.018
	1508	41116	5 58.0	+23 16	4.6†	G5	.11	0.6	.016
	1511	41312	5 59.2	−26 17	5.2	K3	.10	0.0	.009
C	758	41304	5 59.3	+14 24	6.7	F6	.21	3.3	.021
C	760	41330	5 59.5	+35 24	6.1	F9	.33	3.8	.035
	1513	41361	5 59.6	+ 5 26	5.8	G7	.01	0.2	.008
C	761	.....	5 59.7	+26 34	9.3	K6	.43	6.6	.029
	1514	41380	5 59.7	+ 4 10	5.7	G4	.01	0.0	.007
ADS	4771A	41497	6 0.6	+76 31	8.0†	F5	.00	3.3	.011
	1518	41543	6 0.7	+23 39	7.2†	K5	.02	0.3	.004
	1519	41547	6 0.7	−10 14	5.8	F4	.02	2.6	.023
	1520	41597	6 1.2	+58 57	5.4	G8	.04	0.7	.011
	1530	41927	6 2.8	+65 44	5.4	K2	.03	0.3	.010
	1531	42042	6 3.3	−19 9	5.5	M2	.06	−0.9	.005
C	769	42250	6 4.5	+70 49	7.6	G7	.45	5.4	.036
	1540	42341	6 5.0	−14 34	5.7	K2	.06	0.8	.010
	1541	42398	6 5.4	+24 27	5.9	K0	.06	0.5	.008
	1542	42443	6 5.6	−22 45	5.7	F6	.14	3.3	.033
WY	Geminorum	42474	6 5.8	+23 14	7.4	M3ep*	.01	−0.8	.002
	1549	42543	6 6.3	+22 56	6.3	M2	.03	−1.7	.003
C	771	42581	6 6.4	−21 49	8.2	M2	.71	9.2	.158
C	772	42618	6 6.6	+ 6 49	7.1	G4	.31	5.1	.040
	1551	42621	6 6.6	−27 8	5.8	K1	.05	0.7	.010
	1552	42633	6 6.7	+60 2	5.6	K4	.05	0.6	.010
	1557	42855	6 8.0	+86 46	6.6	K2	.10	0.6	.006
	1560	42973	6 8.7	+61 33	5.3	M3	.00	−0.7	.006
	1561A	42995	6 8.8	+22 32	3.7*	M3	.06	−0.8	.013
	1562(B)	.....	6 8.9	+36 11	7.4	F5	.03	3.1	.014
	1563(A)	43017	6 8.9	+36 11	6.4	F4	.06	3.3	.024
BD	−15°1314	43028	6 8.9	−15 21	6.9	G9	.....	0.7	.006
	1564A	43042	6 9.0	+19 11	5.2	F6	.22	2.9	.035
	1565	43039	6 9.0	+29 32	4.5	G6	.27	1.0	.020
20C	380	.....	6 9.2	+47 7	9.2	G6	.53	5.4	.017
C	780	43147	6 9.6	+44 45	8.6	K1	0.41	5.8	0.027

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. m	Sp.	μ	Vis. M	Spec. π
1570A	43232	6^h10^m0	$-6°15'$	4.1	K2	0".02	−0.4	0".013
1571	43244	6 10.1	+46 27	6.5	A2n‡	.05	2.4	.015
BD +28°1062	43246	6 10.1	+28 54	7.3	F0	.04	2.1	.009
1573	43261	6 10.2	+24 0	6.1	G5	.03	1.0	.010
C 783	.....	6 10.5	+25 15	9.0	K6	.48	7.0	.040
1574	43318	6 10.5	− 0 28	5.7	F6	.26	2.6	.024
1576	43380	6 10.8	+46 24	6.5	K2	.13	0.7	.007
1577	43386	6 10.8	+12 18	5.1	F5	.21	3.4	.046
1582	43587	6 12.0	+ 5 8	5.8	F9	.28	3.7	.038
1583	43624	6 12.1	+27 15	6.7	K0	.08	0.7	.006
BD −15°1328	43670	6 12.3	−15 6	7.9	K3	.....	0.7	.004
1584	43740	6 12.8	+23 39	6.6	G3	.02	0.2	.005
1585	43749	6 12.9	+61 48	7.2	F2	.10	3.2	.016
1591	43827	6 13.2	−16 47	5.3	K2	.02	0.2	.010
1593	43905	6 13.6	+53 30	5.7†	F4	.10	2.5	.023
1595	43993	6 14.1	− 9 21	5.7	G9	.04	0.6	.010
1596	44033	6 14.4	+14 42	6.0	M0	.02	0.0	.006
1599	44131	6 15.0	− 2 54	5.2	M1	.01	−0.1	.009
βGC 3319A	44213	6 15.5	+ 5 47	8.1	M5	.....	−0.1	.002
βGC 3319B	44214	6 15.5	+ 5 47	10.0	A4n	.....	2.3	.003
BD +22°1294	44252	6 15.7	+22 57	8.1	F4	.02	2.6	.008
1604A	44478	6 16.9	+22 34	3.2	M3	.13	−0.6	.017
1606	44537	6 17.2	+49 20	5.4†	M0	.01	−2.1	.003
1608A	44708	6 18.1	+58 28	5.5	K5	.01	0.0	.008
1611A	44769	6 18.5	+ 4 39	4.5	A0n	.01	1.6	.026
1611B	44770	6 18.5	+ 4 39	6.5	F4	.01	3.2	.022
1612	44780	6 18.6	+25 6	6.6	G9	.02	0.6	.006
1614	44951	6 19.5	−11 29	5.4	K3	.07	0.3	.010
1615	44974	6 19.7	+21 42	6.6	G6	.02	0.7	.007
1616	45018	6 19.9	−25 31	5.7	K5	.03	−0.4	.006
C 799	45289	6 21.4	−42 49	6.8	G4	.75	5.1	.046
BD +29°1231	45336	6 21.7	+29 19	7.6	K5	.01	0.0	.003
1623A	45352	6 21.8	+20 51	6.6	K2	.06	0.7	.007
C 801	45391	6 22.0	+36 33	7.1	G0	.39	4.9	.036
1626	45416	6 22.1	+ 0 22	5.3	cK0	.01	−1.4	.005
1627	45410	6 22.1	+58 14	6.0	G8	.33	2.5	.020
1628	45415	6 22.1	+ 2 58	5.8	G9	.05	0.3	.008
1630	45433	6 22.1	− 0 13	5.8	K5	.01	0.2	.008
1632	45466	6 22.6	+46 45	6.0	K4	.01	0.4	.008
C 803	.....	6 22.9	+27 5	8.3	K4	.50	6.6	.046
BD +29°1248	45784	6 24.4	+29 53	8.1	F2	.05	2.2	.007
1643	45866	6 24.9	+78 5	5.9	K5	.02	0.1	.007
ADS 5146A	45951	6 25.4	+17 0	6.2	K2	.07	0.4	.007
1649(B)	.....	6 26.5	+17 51	8.1†	F6	.06	2.2	.007
1650(A)	46136	6 26.5	+17 51	7.2	F6	0.04	2.1	0.010

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
1651.....	46184	$6^h26^m.7$	−12°19′	5.3	K2	0″.03	0.3	0″.010
1653.....	46241	6 27.0	+ 4 56	6.0	G8	.03	0.2	.007
1654.....	46229	6 27.0	− 8 5	5.6	K2	.02	0.4	.009
1658.....	46318	6 27.6	+56 28	7.0†	Fo	.06	2.8	.014
1663.....	46374	6 27.9	+14 14	5.6	K2	.10	0.5	.010
1665.....	46480	6 28.6	+61 34	6.0	G7	.34	2.9	.024
1673.....	46588	6 29.2	+79 40	5.6	F6	.62	3.2	.033
ADS 5234A....	46780	6 30.2	+27 22	7.0	G2	.06	4.2	.027
1679.....	46781	6 30.2	+16 53	6.7	F8	.04	2.7	.016
BD +45°1330.....	47019	6 31.4	+45 8	8.8	M2	.....	0.0	.002
20C 393.....	.....	6 31.5	+17 38	9.5	M1	.84	9.4	.096
1687.....	47070	6 31.7	+39 29	5.7	K5	.12	0.3	.008
1690.....	47105	6 31.9	+16 29	2.2†	A3s	.06	0.8	.052
βGC 3499A....	47127	6 32.0	+12 16	7.6	G5	.29	5.3	.035
BD +12°1222.....	47128	6 32.0	+12 14	8.3	Fo	.07	2.8	.008
1692(A)..	47138	6 32.0	−18 35	5.8	G4	.02	0.8	.010
1694.....	47174	6 32.2	+42 35	5.1	K2	.06	0.4	.011
1695.....	47205	6 32.3	−19 10	4.1	K1	.10	0.7	.021
BD +44°1509.....	47335	6 33.0	+44 25	6.8	G8	.04	0.8	.006
1698.....	47442	6 33.5	−18 9	4.6	K1	.02	0.4	.014
1703.....	47667	6 34.7	−14 3	5.0	K5	.01	−0.7	.007
1704.....	47731	6 35.0	+28 17	6.5	cG5	.02	−1.6	.002
C 821.....	47752	6 35.1	+24 3	8.0	K6	.34	7.1	.066
1707.....	47914	6 35.8	+44 37	5.2	K5	.06	0.5	.011
1712A....	47977	6 36.0	+59 33	8.3†	F4	.02	3.0	.009
1715.....	48217	6 37.2	− 9 4	5.3	Mo	.04	0.4	.010
ADS 5379A....	48228	6 37.3	+40 44	6.9	M4	.17	−0.8	.003
1716A....	48250	6 37.4	+59 33	5.4†	A2n	.02	1.8	.019
BD +44°1525.....	48270	6 37.5	+44 37	6.8	Ko	.02	0.3	.005
1717A....	48329	6 37.8	+25 14	3.2	cG8	.02	−2.1	.009
C 827.....	48410	6 38.2	+44 20	7.8	Go	.25	4.4	.021
1720.....	48432	6 38.3	+57 16	5.5	G6	.05	0.9	.012
1721A....	48433	6 38.3	+13 20	4.6	K2	.06	−0.4	.010
1722.....	48450	6 38.4	+29 4	5.5	K3	.03	0.4	.010
1724A....	48682	6 39.5	+43 41	5.3	F8	.16	4.0	.055
1725.....	48737	6 39.7	+13 0	3.4	F3	.23	2.2	.057
1726(B)..	48767	6 39.9	+55 49	6.6†	F6	.13	3.6	.025
1727(A)..	48766	6 39.9	+55 49	6.3	F4	.13	3.4	.026
1728.....	48781	6 40.0	+48 54	5.3	Ko	0.01	0.1	.009
1732A....	48915	6 40.7	−16 35	−1.6	A2s	1.32	1.2	.363
BD +83° 172.....	48974	6 41.1	+83 45	8.6	G5	0.24	4.8	.017
1735.....	49095	6 41.6	−31 41	5.9	F6	.40	3.8	.038
1737.....	49161	6 41.9	+ 8 9	5.0	K5	.02	0.3	.011
1740.....	49293	6 42.6	+ 2 31	5.0†	Ko	.03	−0.1	.010
1743.....	49331	6 42.8	− 8 53	5.3	Mo	0.04	−2.7	0.003

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
1745.....	49380	$6^h43^m.2$	+32°43′	5.8	K4	0″.07	0.2	0″.008
1748.....	49520	6 43.7	+41 54	5.0	K3	.14	0.2	.011
1753A....	49618	6 44.3	+59 34	5.7†	Go	.05	0.2	.008
BD +18°1365.....	49635	6 44.3	+18 54	7.7	F3	.....	3.2	.013
1756.....	49738	6 44.8	+13 32	5.9	K3	.01	0.1	.007
1758.....	49878	6 45.5	+77 6	5.1†	K5	.08	0.5	.012
ADS 5505A....	49933	6 45.7	− 0 26	5.8	F2	.17	3.2	.030
1760.....	49968	6 45.9	+23 43	5.8	K5	.04	0.5	.009
1762A....	50018	6 46.1	+38 59	6.1	A7n	.01	1.7	.013
1764.....	50037	6 46.4	+38 34	6.3	F5	.18	3.2	.024
C 834.....	50281	6 47.4	− 5 3	6.8	K6	.58	6.8	.100
1776A....	50522	6 48.6	+58 33	4.8†	G6	.13	0.9	.017
1778A....	50635	6 49.0	+13 18	4.7	A7n	.11	2.1	.030
1778B....	.....	6 49.0	+13 18	7.4	G4	.11	4.9	.032
1780.....	50692	6 49.2	+25 30	5.8	Go	.04	4.4	.052
C 837.....	.....	6 49.5	+40 13	8.4	Mo	.44	7.5	.066
1783.....	50778	6 49.5	−11 55	4.2	K4	.14	0.3	.017
1784.....	50806	6 49.6	−28 24	6.0	G3	.54	4.5	.050
BD +40°1759.....	.....	6 49.7	+40 12	10.7	A4n	.03	2.0	.002
1785.....	50877	6 50.0	−24 4	4.1	cK5	.01	−2.4	.005
ADS 5669A....	51067	6 50.8	+75 22	6.8	F8	.26	3.9	.026
ADS 5669B....	.....	6 50.8	+75 22	7.8	Ko	.26	5.7	.038
1789A....	51199	6 51.3	−20 1	4.6	F2	.06	1.7	.026
C 841.....	51219	6 51.4	+ 1 18	7.7	G5	.57	4.9	.027
BD +69° 400.....	51349	6 51.9	+69 21	7.5	M2	.00	−0.7	.002
1794.....	51440	6 52.2	+38 11	6.2	Ko	.13	0.6	.008
1796.....	51530	6 52.6	+26 13	6.1	F4	.18	3.3	.027
BD + 2°1483.....	51565–6	6 52.7	+ 2 26	8.2†	F2‡	.....	2.2	.006
BD −10°1786.....	51700	6 53.3	−10 39	6.8	Ko	.03	0.2	.005
1799A....	51733	6 53.4	−24 30	5.6†	Fo	.10	3.0	.030
1801.....	51802	6 53.7	+87 12	5.3	M2	.05	−0.1	.008
C 847.....	51866	6 54.0	+48 32	8.2	K5	.70	6.7	.050
1803.....	52005	6 54.5	+16 13	5.9	cK4	.02	−2.4	.002
BD +33°1454.....	52201	6 55.2	+33 50	7.3	A8s	.....	1.9	.008
1806.....	52497	6 56.3	+24 21	5.2	cG2	.02	−1.2	.005
1808.....	52666	6 57.0	− 5 35	5.4	M2	.01	−0.3	.007
1809.....	52711	6 57.2	+29 30	6.0	G2	.83	4.2	.044
1810A....	52877	6 57.7	−27 47	3.7	Mo	.01	−2.0	.007
1813.....	52960	6 58.1	+11 6	5.2	K5	.03	0.1	.010
1814(C)..	268518	6 58.2	+20 45	8.4	G1	.12	4.7	.018
1818.....	53208	6 59.2	− 5 11	5.9	K5	.01	−1.0	.004
1822.....	53329	6 59.6	+34 38	5.6	G3	.09	1.4	.014
1824.....	53633	7 0.7	+60 57	6.7	K1	.05	0.8	.007
1825A....	53683	7 0.8	+60 54	8.7	G9	.04	0.7	.003
BD +34°1530.....	53686	7 0.9	+34 9	6.4†	K4	0.03	0.3	0.006

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
C 855	54046	$7^h\ 2^m3$	+15°41′	7.5	F8	0″.23	4.2	0″.022
1832	54079	7 2.4	+ 7 38	5.9	Ko	.03	0.6	.009
BD +59°1053	54099	7 2.5	+59 13	7.6	G7	.06	0.3	.003
C 856	54100	7 2.5	+15 41	7.4	F7	.21	4.2	.023
BD +60°1034	54122	7 2.6	+60 23	7.3	G8	.03	0.5	.004
1835A	54131	7 2.6	+16 5	5.6	G8	.11	0.6	.010
ADS 5816A	54244	7 3.0	+17 4	7.6	K5	.02	0.6	.004
ADS 5816B	.....	7 3.0	+17 4	7.7	K4	.02	0.8	.004
ADS 5827A	54371	7 3.4	+25 54	7.3†	G6	.22	4.7	.030
C 861	54563	7 4.2	+21 25	6.4	G7	.51	4.8	.048
1839	54605	7 4.3	−26 14	2.0	cG3	.00	−3.8	.007
ADS 5854A	54649	7 4.6	+55 58	7.7	K1	.04	0.5	.004
1840A	54719	7 4.8	+30 25	4.5	K3	.05	−0.1	.012
1841	54716	7 4.8	+39 29	5.1	K5	.05	0.0	.010
1844	54810	7 5.3	− 4 5	5.0	K1	.22	0.6	.013
1846	54895	7 5.6	+51 36	5.7	M3	.02	0.0	.007
1848	55057	7 6.3	− 0 8	5.4	A8n	.02	1.7	.018
1849	55070	7 6.3	−27 20	5.6	G7	.02	0.4	.009
1850	55052	7 6.4	+24 18	5.8	F3	.06	2.6	.023
ADS 5871AB	55130	7 6.6	+27 24	7.1†	F6	.09	3.7	.021
BD +60°1038	55178	7 6.8	+59 56	7.3	G5	.04	0.9	.005
1854	55280	7 7.2	+59 49	5.3	K2	.27	2.0	.022
1856A	55383	7 7.6	+16 20	5.3	M4	.05	−0.5	.007
C 867	55458	7 7.8	+25 11	8.4	K1	.45	6.0	.033
1860	55575	7 8.4	+47 25	5.6	F8	.18	4.1	.050
1861A	55621	7 8.6	+25 4	6.0	M1	.11	0.2	.007
1864	55730	7 9.0	+12 17	5.8	G5	.06	1.1	.011
1865	55751	7 9.1	+ 3 17	5.6	Ko	.03	0.3	.009
1868	55870	7 9.7	+28 4	5.9	M1	.02	−0.1	.006
1871	55966	7 10.1	+82 36	5.1	M4	.04	0.0	.010
1873A	56003	7 10.2	+ 0 1	6.5	G5	.02	0.3	.006
1876	56099	7 10.5	+59 18	7.6	F7	.08	3.4	.014
1878	56160	7 10.8	−26 52	5.8	K4	.05	0.5	.009
1881	56243	7 11.2	+59 26	6.9	K5	.04	0.2	.005
C 873	56274	7 11.3	−12 53	7.7	F9	.51	3.9	.017
1887(A)	56577	7 12.4	−23 8	4.8	Mo	.00	−1.9	.005
1888(B)	56578	7 12.4	−23 8	7.0	Fo	.06	2.6	.013
BD −14°1810	56617	7 12.6	−14 40	8.1	F5	.....	2.8	.009
1889	56618	7 12.6	−27 42	4.8	M3	.04	−0.4	.009
20C 418	.....	7 13.0	+33 2	10.0	M2	.56	8.9	.060
1894A	56820	7 13.5	+60 5	6.3	Fo	.01	1.9	.013
1897	56963	7 14.1	+45 25	5.6	A7s	.04	1.7	.017
1898A	56986	7 14.2	+22 10	3.8†	A8n	.02	2.2	.048
1898B	.....	7 14.2	+22 10	8.0	K6	.02	6.9	.060
1900A	57044	7 14.5	+73 16	7.1†	A7n	0.04	2.1	0.010

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
1902(B)	57066	7^h14^m6	+50°20′	7.7†	A5n	0″.06	2.1	0″.008
1903(A)	57067	7 14.6	+50 20	7.6†	A5n	.05	1.9	.007
1908	57146	7 14.8	−26 24	5.4	cG5	.03	−2.8	.002
1912A	57264	7 15.4	+36 57	5.2	G9	.09	0.9	.014
1914	57423	7 16.0	+20 38	5.2	Mo	.07	0.2	.010
1915	57478	7 16.4	−14 10	5.7	G5	.02	0.8	.010
1916	57508	7 16.5	+81 6	6.5	G7	.00	0.6	.007
1918	57615	7 17.0	−25 42	6.1	M4	.03	−0.3	.005
1919	57669	7 17.2	+40 52	5.3	Ko	.02	−0.7	.006
1921	57727	7 17.4	+25 15	5.1	G5	.07	1.0	.015
1923	57749	7 17.5	− 5 48	5.8	F3	.02	2.0	.017
C 884	.....	7 17.7	+46 18	9.2	K2	.45	6.1	.024
1926	57927	7 18.3	+27 50	5.7	Fo	.02	1.8	.017
1931	58207	7 19.5	+28 0	3.9	G7	.14	0.7	.023
1936	58367	7 20.2	+ 9 28	5.1	G5	.02	0.3	.011
1937	58425	7 20.5	+68 40	5.8	K2	.04	0.7	.010
1938	58461	7 20.5	−13 33	5.8	Fo	.20	2.8	.025
1940	58551	7 20.9	+21 44	6.5	F4	.31	3.7	.027
1941	58579	7 21.0	+20 27	5.9	A6n	.03	1.9	.016
1945A	58728	7 21.8	+21 39	5.8†	F4	.13	3.1	.029
BD +29°1535	58746	7 21.9	+29 37	7.4	A8n	.03	1.9	.008
βGC 4062A	233399	7 22.3	+50 11	9.0	G3	.05	4.2	.011
βGC 4062B	.....	7 22.3	+50 11	9.4	G4	.05	0.7	.002
1948	58855	7 22.3	+49 53	5.4	F5	.14	3.3	.038
ADS 6117AB	58945	7 22.7	+50 12	8.7†	A9n	.04	2.3	.005
1951A	58954	7 22.7	−17 40	5.7	A5n	.01	2.1	.019
1952A	58946	7 22.7	+31 59	4.2	A8s	.24	2.4	.044
1953A	58972	7 22.7	+ 9 7	4.9†	K4	.06	0.1	.011
1957A	59067	7 23.2	−11 21	6.8†	F1‡	.01	2.8	.016
1959A	59148	7 23.6	+28 7	5.4†	K1	.05	0.5	.010
C 897	59201	7 23.8	+73 29	8.4	K2	.32	6.2	.036
1962	59294	7 24.2	+12 13	4.8	K3	.02	−0.3	.010
1963	59311	7 24.3	− 1 42	5.8	K5	.01	−0.1	.007
1964	59380	7 24.6	− 7 21	6.0	F5	.14	3.4	.030
1965A	59438	7 24.8	−14 47	6.4†	F4	.32	3.3	.024
BD + 8°1791	59604	7 25.6	+ 8 46	7.2	F2	.....	3.2	.016
1968	59612	7 25.6	−22 49	4.8	cA7s	.01	0.9	.017
U Monocerotis	59693	7 26.0	− 9 34	7.1*	cG2e	.04	−2.0	.002
1971	59686	7 26.0	+17 18	5.6	K2	.09	0.5	.010
BD +66° 512	59720	7 26.3	+66 41	7.5	M4	.02	−0.2	.003
1975	60081	7 27.7	+15 51	6.7	G8	.01	0.3	.005
BD −18°1893	60092	7 27.8	−18 17	7.5	F5	.....	2.3	.009
1979C	.....	7 28.2	+32 5	9.5†	M1e‖	.20	8.8	.072
TY Puppis*	60265	7 28.5	−20 35	9.3†	A9n	.....	2.4	.004
1980	60294	7 28.6	+55 59	6.0	K2	0.04	0.6	0.008

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
1981A....	60318	7^h28^m8	+31°11′	5.8†	Ko	0″.03	0.2	0″.008
1982.....	60341	7 28.9	−19 12	5.8	K3	.08	0.4	.008
1985.....	60414	7 29.2	−14 18	5.4†	M3ep*	.02	−1.8	.004
1986.....	60437	7 29.3	+46 24	5.8	Mo	.05	0.2	.008
1987.....	60522	7 29.8	+27 7	4.2	Mo	.12	0.0	.014
1988.....	60532	7 29.8	−22 5	4.5	F5	.08	3.0	.050
1989(A)..	60584	7 30.1	−23 15	5.9	F4	.09	3.0	026
1990(B)..	60585	7 30.1	−23 15	6.0	F5	.13	2.8	.023
1997A....	60986	7 32.0	+35 16	5.6	G5	.04	0.8	.011
1999.....	61064	7 32.3	− 3 53	5.2	F5	.07	1.5	.018
2000.....	61106	7 32.6	+57 19	6.2	K5	.02	0.5	.007
2001.....	61110	7 32.6	+34 49	4.9	F1	.12	2.2	.029
2005.....	61338	7 33.7	+17 54	5.2	Mo	.00	−0.1	.009
2006.....	61363	7 33.8	+48 22	5.8	G6	0.14	0.9	.010
2008A....	61421	7 34.1	+ 5 29	0.5	F3	1.24	3.1	.331
2016.....	61772	7 35.8	−15 2	5.2	K5	0.03	−0.3	.008
2020.....	61913	7 36.4	+14 27	5.8	M3	.02	−1.0	.004
2021.....	61935	7 36.5	− 9 19	4.1	Ko	.08	0.6	.020
2023.....	62044	7 37.1	+29 8	4.6†	K1p*	.25	0.5	.015
2024.....	62066	7 37.1	+65 42	6.0	K2	.05	0.3	.007
2028.....	62285	7 38.0	+26 1	5.4	Mo	.03	−0.4	.007
C 922.....	62301	7 38.1	+39 49	6.8	F4	.68	3.9	.026
2029A....	62345	7 38.4	+24 38	3.7	G7	.07	0.6	.024
2030.....	62412	7 38.7	−26 7	5.8	G5	.03	0.9	.010
2031A....	62509	7 39.2	+28 16	1.2	G8	.62	0.9	.087
2032A....	62576	7 39.5	−28 10	4.8	K5	.01	−0.1	.010
2034.....	62613	7 39.8	+80 31	6.5	G8	.48	5.0	.050
2037.....	62647	7 40.0	+37 46	5.4	M3	.03	−0.3	.007
2040.....	62721	7 40.3	+18 45	5.3†	K5	.10	0.2	.010
ADS 6369A....	.....	7 40.8	+53 55	8.8	K6	.56	6.6	.036
2049A....	62898	7 41.1	+33 40	5.3	Mo	.04	−0.3	.008
2050.....	62902	7 41.1	− 6 32	5.7	K5	.11	0.6	.010
2051.....	62952	7 41.3	−14 19	5.1	A6n	0.02	1.6	.020
2053.....	63077	7 41.8	−33 59	5.4	Go	1.72	4.6	.069
2054A....	63208	7 42.6	+23 23	6.9†	F3‡	0.02	3.2	.018
2057.....	63332	7 43.2	+54 23	6.0	F6	.05	3.5	.032
2058A....	63336	7 43.3	−11 57	5.7†	F5	.12	3.7	.040
2064.....	63660	7 44.8	−24 40	5.6†	G3	.04	0.9	.011
2065A....	63700	7 45.1	−24 37	3.5	cG6	.01	−2.9	.005
2068.....	63752	7 45.4	− 8 56	5.8	K3	.01	−0.9	.005
2074.....	64092	7 47.1	+22 35	7.1	G6	.02	0.5	.005
2075A....	64096	7 47.1	−13 38	5.8†	G2	.34	4.8	.063
CD −33°4218.....	64101	7 47.1	−33 49	8.3	A4n	.16	2.0	.005
2076.....	64106	7 47.2	+47 39	6.4	K2	0.02	0.5	.007
C 935.....	64090	7 47.2	+30 55	8.2	F8	1.96	4.2	0.016

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
2077.....	64152	7^h47^m4	−20°55′	5.8	G8	0″.06	0.7	0″.010
2079.....	64144	7 47.4	+47 49	5.7	K4	.04	0.2	.008
2082.....	64238	7 47.7	−14 35	5.7	cF3	.02	−0.4	.006
ADS 6426A....	64259	7 47.8	−13 36	6.9	K1	.09	0.4	.005
2084.....	64307	7 48.2	+74 11	5.6	K5	.03	−0.2	.007
2086.....	64379	7 48.5	−34 27	5.0	F3	.33	3.3	.046
C 949.....	64468	7 49.1	+19 31	7.9	K6	.47	6.6	.055
2092.....	64685	7 50.1	+ 9 8	5.8	F4	.09	2.9	.026
2098.....	64960	7 51.3	+16 3	6.0	K3	.06	0.4	.008
ADS 6483AB..	65123	7 52.1	+ 1 24	7.1†	F6	.18	3.7	.021
BD − 0°1864.....	65158	7 52.3	− 0 21	7.0	A2s	.01	1.4	.008
2099.....	65228	7 52.6	−22 37	4.4	cG2	.04	−2.6	.004
2101.....	65301	7 53.0	+59 19	5.8	F2	.03	2.3	.020
2104.....	65345	7 53.2	+ 2 29	5.4	G6	.18	0.8	.012
2106.....	65448	7 53.6	+63 22	6.0	G1	.02	1.2	.011
2107.....	65429	7 53.6	+61 16	6.7	F3	.04	3.3	.021
C 947.....	65430	7 53.7	+21 8	7.8	K1	0.57	5.7	.038
C 949.....	65583	7 54.3	+29 31	6.9	G7	1.17	5.2	.046
2112.....	65626	7 54.5	+57 33	7.0†	F8	0.08	3.2	.017
2117.....	65714	7 54.9	+25 40	5.9	G8	.01	−0.1	.006
BD +54°1190.....	65734	7 55.0	+54 25	7.5	A6n	.01	2.0	.008
2118.....	65759	7 55.1	+17 35	5.8	K3	.02	0.0	.007
2126.....	65953	7 56.1	− 1 7	4.9	K5	.10	−0.1	.010
2129.....	66138	7 57.0	+58 3	6.8	F3	.12	3.1	.018
2130.....	66141	7 57.1	+ 2 37	4.6	K3	.11	0.1	.013
C 952.....	66171	7 57.2	+72 13	8.0	G0	.50	3.9	.015
2131.....	66216	7 57.4	+28 4	5.3†	K2	.06	0.3	.010
2133.....	66347	7 57.9	+22 21	6.8	K3	.04	0.3	.005
ADS 6554AB..	66509	7 58.8	+12 35	8.7†	K2	.14	5.6	.024
ADS 6608A....	66633	7 59.4	+74 39	8.6†	A6n	.05	1.9	.005
BD +12°1762.....	66637	7 59.4	+12 29	8.5	K2	.....	−0.1	.002
2139.....	66751	8 0.0	+70 1	6.5	F8	.20	4.2	.035
2140.....	66783	8 0.0	−17 23	6.6	K5	.02	−0.2	.004
2144.....	66875	8 0.4	+22 55	6.2	M3	.02	−0.7	.004
2146.....	67228	8 1.9	+21 52	5.4	G3	.08	4.1	.055
2148.....	67370	8 2.5	+42 43	6.4	K3	.07	0.4	.006
2149A....	67402	8 2.7	+27 46	6.8	G9	.04	0.4	.005
2150.....	67447	8 2.9	+68 46	5.5	G4	.01	−0.6	.006
C 961.....	67458	8 2.9	−29 6	6.9	G2	.52	4.5	.033
2152.....	67483	8 3.1	+13 56	6.3	F3	.03	2.6	.018
ADS 6623A....	67501	8 3.2	+32 31	7.1†	F5	.01	3.0	.015
ADS 6623B....	.....	8 3.2	+32 31	8.0	F8	.01	2.9	.010
2153.....	67523	8 3.3	−24 1	3.2†	cF5	.10	−0.7	.017
2155A....	67594	8 3.6	− 2 42	4.4	cG6	.02	−2.2	.005
2156.....	67690	8 4.2	+26 8	6.7	K3	0.04	0.0	0.005

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	2157.....	67767	$8^h\ 4^m.4$	+25°49′	5.8	G6	0″.36	4.2	0″.048
	2161.....	68017	8 5.4	+32 46	7.0	G4	.80	4.9	.038
	2162.....	68077	8 5.9	+56 45	5.9	G9	.04	0.1	.007
	2163.....	68146	8 6.0	−13 30	5.6	F7	.24	3.4	.036
	2168(A)..	68257	8 6.5	+17 57	6.1†	F7	.15	3.6	.032
	2169(C)..	68256	8 6.5	+17 57	6.0	G2	.14	4.4	.048
	2170A....	68290	8 6.6	−12 38	4.7	G7	.03	0.8	.017
	2172.....	68312	8 6.7	− 7 28	5.4	G8	.06	0.9	.013
	2173.....	68351	8 7.0	+29 57	5.9†	A2sp*	.02	0.9	.010
	2174.....	68375	8 7.0	+76 4	5.7	G6	.03	0.9	.011
	2178A....	68457	8 7.4	+60 41	6.4	A7s	.02	2.0	.013
C	971.....	68638	8 8.1	+57 24	7.8	G6	.40	5.4	.033
C	973.....	68744	8 8.7	+73 39	8.6	G1	.27	4.2	.013
	2182.....	68771	8 8.7	+59 30	6.7	K2	.04	0.7	.006
	2183.....	68752	8 8.7	−15 29	5.0	G6	.02	−0.4	.008
C	974.....	68788	8 8.8	+73 44	8.6	K1	.56	6.2	.033
	2186A....	68951	8 9.7	+72 43	6.2	Mo	.03	0.0	.006
ADS	6736A....	69054	8 10.1	+75 8	6.5	K1	.09	0.7	.007
	2193.....	69148	8 10.6	+62 49	6.1†	G5	.02	0.4	.007
	2195A....	69267	8 11.1	+ 9 30	3.8	K4	.08	0.2	.019
C	977.....	.....	8 12.0	+30 56	8.7	K6	.87	7.2	.050
BD	+ 4°1945.....	69479	8 12.1	+ 4 31	7.0†	F8‡	.02	3.6	.021
	2197.....	69548	8 12.4	+58 3	5.9	F2	0.06	3.5	.033
	2199.....	69830	8 13.7	−12 18	6.0	Ko	1.03	5.3	.072
	2201.....	69879	8 13.9	−29 42	6.4	G6	0.05	0.8	.008
	2202.....	69897	8 14.0	+27 32	5.2	F6	.39	3.4	.044
	2203.....	69976	8 14.3	+60 57	6.5	Ko	.01	0.7	.007
	2205.....	69994	8 14.5	+21 4	5.9	K1	.09	0.5	.008
	2208.....	70272	8 16.0	+43 31	4.4	K5	.11	0.1	.014
C	982.....	70352	8 16.3	+66 48	8.9	K5	.52	6.5	.033
	2212.....	70442	8 16.9	−19 46	5.9†	Go‡	.04	0.9	.010
	2215.....	70523	8 17.4	−17 16	5.8	Ko	.09	0.5	.009
	2218.....	70569	8 17.6	+18 39	5.9	Fo	.06	3.1	.027
	2220A....	70647	8 17.9	+42 20	6.2	K5	.01	−0.1	.005
BD	+39°2095.....	70648	8 18.0	+39 49	8.8	A4n	.02	1.6	.004
	2221.....	70673	8 18.1	−12 44	6.3	G7	.06	0.6	.007
	2223A....	70734	8 18.5	+10 57	6.3	M2	.02	0.3	.006
	2224A....	70761	8 18.6	−26 2	5.9	cF5	.02	−1.2	.004
20C	473.....	.....	8 18.9	+32 57	9.9	K6	.64	7.4	.032
	2227.....	70958	8 19.6	− 3 26	6.0†	F2	.22	3.5	.032
	2229.....	71030	8 20.2	+17 23	6.2	F4	.25	3.0	.023
	2231.....	71088	8 20.3	+67 38	6.0	G7	.06	0.8	.009
	2232A....	71093	8 20.4	+28 13	5.8	K4	.13	0.6	.009
	2234A....	71115	8 20.5	+ 7 53	5.2	G6	.04	0.6	.012
	2236.....	71148	8 20.6	+45 59	6.3	G4	0.36	4.9	0.052

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
2238(A)..	71152	$8^h20^m.7$	+24°52′	7.1	F1	0″.10	2.8	0″.014
2239(B)..	71153	8 20.7	+24 52	7.6	F6	.09	4.0	.019
2240(B)..	71150	8 20.7	+27 16	6.3	A2n	.01	2.1	.014
2241(A)..	71151	8 20.7	+27 16	6.3	A3n	.01	2.0	.014
2243(B)..	.....	8 20.8	−23 43	8.5	K3	.03	−0.3	.002
2245.....	71250	8 21.2	+12 59	5.8	M3	.12	−1.1	.004
2246A....	71297	8 21.5	− 3 40	5.4	Fo	.07	2.6	.027
2247A....	71369	8 22.0	+61 3	3.5	G1	.17	0.5	.025
2248	71377	8 22.0	−12 12	5.7	K3	.10	0.2	.008
ADS 6829A....	71449	8 22.4	+51 32	9.3†	A9n	.06	1.8	.003
20C 474.....	.....	8 22.5	+46 15	9.9	K6	.50	7.4	.032
2254AB..	71663	8 23.4	− 2 11	7.0†	Fo	.03	2.6	.013
2256.....	71704	8 23.7	+67 38	7.8	G7	.06	1.0	.004
C 996.....	71881	8 24.7	+50 58	7.4	G3	.38	4.7	.029
2260.....	71952	8 25.1	+53 27	6.5	Ko	.09	2.2	.014
2261.....	71986	8 25.3	+85 24	7.4	F5	.13	3.2	.014
2263.....	72041	8 25.6	+24 25	5.7	A9n	.11	2.2	.020
2265A....	72094	8 25.9	+18 26	5.6	M1	.09	−0.2	.007
BD +29°1772.....	72146	8 26.2	+29 39	7.1	G6	.02	1.1	.006
2268.....	72184	8 26.4	+38 22	6.0	K3	.20	0.5	.008
2271.....	72292	8 26.9	+20 47	5.5	K5	.06	0.7	.011
2272.....	72291	8 26.9	+36 47	6.1	F1	.14	4.0	.038
2275.....	72324	8 27.1	+24 25	6.4	K1	0.09	0.0	.005
20C 475.....	.....	8 27.4	+67 38	9.2	Mo	1.09	8.3	.066
BD +54°1244.....	72522	8 28.2	+54 4	8.7	G8	*	0.7	.003
2278.....	72582	8 28.6	+73 59	6.3	G7	0.11	0.6	.007
C 1000.....	72614	8 28.8	+42 6	8.6	K6	0.66	6.6	.040
ADS 6871AB..	72626	8 28.8	−24 16	6.9†	A7s	.....	1.8	.010
2279.....	72673	8 29.0	−31 11	6.4	G8	1.34	5.9	.079
2282.....	72779	8 29.6	+19 56	6.6	F5	0.04	1.9	.011
BD +20°2123.....	72846	8 30.0	+20 7	8.3	A3n	.06	1.8	.005
2284.....	72905	8 30.3	+65 22	5.7	Go	.09	4.2	.050
2285(A)..	72945	8 30.5	+ 6 58	6.3†	F6	.20	4.1	.036
2286(B)..	72946	8 30.5	+ 6 58	7.2	G5	.20	5.2	.040
2287.....	72968	8 30.6	− 7 38	5.6	A4sp*	.03	0.9	.011
2289.....	73017	8 30.9	+53 45	5.7	G6	.07	1.4	.014
2290.....	73108	8 31.5	+64 41	4.8	K2	.05	0.5	.014
BD +20°2129.....	73142	8 31.7	+20 50	8.1	F7	.04	3.1	.010
BD +20°2131.....	73161	8 31.8	+20 22	9.1	A4n	.04	2.1	.004
2293.....	73171	8 31.9	+53 4	6.0	K1	.04	0.6	.008
BD +20°2132.....	73174	8 31.9	+20 6	8.3	F2p*	.03	2.4	.007
BD +20°2133.....	73175	8 32.0	+19 52	8.2	A4n	.03	2.1	.006
2294.....	73192	8 32.1	+33 9	6.1	K2	.02	0.1	.006
BD +19°2053.....	73210	8 32.1	+19 38	6.7	A6n	.03	2.1	.012
C 1008.....	73226	8 32.2	+26 24	7.7	G2	0.24	4.8	0.026

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. m	Sp.	μ	Vis. M	Spec. π
BD +20°2136	73294	8^h32^m6	+20°34′	8.1	F6	0″.01	2.3	0″.007
BD +20°2138	73345	8 32.9	+20 21	8.6	A7n	.04	1.7	.004
C 1012	73393	8 33.1	+56 2	8.1	G2	.46	4.7	.021
BD +21°1880	73428	8 33.3	+21 9	8.8	G4	.03	0.4	.002
BD +20°2141	73430	8 33.3	+20 22	8.7	A6n	.04	1.6	.004
2300	73449	8 33.4	+20 2	8.1	A3n	.03	1.7	.005
2301	73450	8 33.4	+19 57	8.6	A6n	.03	1.5	.004
2302	73471	8 33.5	+ 3 42	4.5	K3	.03	−0.3	.011
2304	73508	8 33.7	+33 5	6.9	K0	.05	0.6	.005
BD +20°2148	73574	8 34.0	+20 26	8.1	A8n	.04	1.4	.005
2305	73575	8 34.0	+20 8	6.7	A6n	.04	1.5	.009
BD +19°2064	73576	8 34.0	+19 38	7.8	A3n	.03	1.8	.006
2306	73593	8 34.1	+46 11	5.5	G6	.08	2.6	.026
ADS 6915D	73598	8 34.1	+19 54	6.7	G6	.04	0.9	.007
ADS 6915A	73618	8 34.2	+19 55	7.4†	A6s‖	.04	1.3	.006
ADS 6915C	73619	8 34.2	+19 54	7.9†	F1p‖	.04	2.1	.007
2308	73665	8 34.4	+20 22	6.5	G7	.04	0.8	.007
2309	73666	8 34.4	+20 19	6.5	A2s	.04	0.7	.007
C 1014	73667	8 34.4	+11 53	7.9	K3	.53	6.8	.060
ADS 6913A	73668	8 34.4	+ 6 8	7.8	G3	.33	5.0	.027
ADS 6913B	.....	8 34.4	+ 6 8	8.8	G9	.33	5.9	.026
BD +20°2163	73711	8 34.6	+19 53	7.4	A6n	.03	2.0	.008
2310C	73709	8 34.6	+20 3	9.0†	cF0	.03	2.5	.005
2310A	73710	8 34.6	+20 1	6.4	G7	.04	0.8	.008
BD +19°2069	73712	8 34.6	+19 42	6.8	A5n	.03	1.8	.010
BD +20°2168	73730	8 34.7	+20 12	8.7	F3p*	.04	2.6	.006
2311A	73731	8 34.7	+19 54	6.8†	A6n‖	.04	1.5	.009
2312A	73752	8 34.8	−22 19	5.2†	G6	.48	4.6	.076
BD +19°2073	73763	8 34.9	+19 35	8.0	A4n	.04	2.0	.006
2313	73785	8 35.0	+20 4	6.7	A6n	.04	1.6	.010
2314	73819	8 35.2	+19 56	6.8	A5n	.04	1.7	.010
2315	73840	8 35.3	−12 7	5.2	K5	.09	0.2	.010
ADS 6930A	73871	8 35.5	+20 50	7.1†	A4n	.00	2.3	.011
BD +20°2179	73872	8 35.5	+20 17	8.8	A3n	.04	2.0	.004
ADS 6931A	73890	8 35.6	+19 37	8.9†	A4n	.04	1.9	.005
2317A	73898	8 35.6	−29 12	5.0	G4	.09	1.4	.019
BD +33°1742	73922	8 35.8	+33 44	8.5	K3	.....	0.4	.002
BD +20°2185	73974	8 36.1	+20 14	7.0	G7	.04	0.6	.005
20C 481	74000	8 36.2	−15 59	9.4	A9s	.63	2.7	.005
BD +19°2083	74028	8 36.5	+19 46	7.9	A6n	.04	1.9	.006
2321A	74137	8 37.1	−15 35	5.0	G8	.08	0.9	.015
2328	74228	8 37.7	+13 2	6.2†	A9s‡	.01	2.7	.020
BD +44°1783	74327	8 38.3	+44 33	8.5	A9s	.06	2.1	.005
2333A	74377	8 38.6	+42 3	8.2	K5	.70	6.8	.052
2335A	74395	8 38.8	− 6 52	4.7	cG4	0.01	−1.4	0.006

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
2336A	74442	8h39m0	+18°31′	4.2	K0	0″.24	0.5	0″.018
2338	74485	8 39.2	+31 4	6.1	G4	.02	1.0	.010
BD +33°1754	74484	8 39.3	+33 36	8.0	M0	.01	−1.3	.001
2339	74521	8 39.3	+10 27	5.6	A4sp*	.03	0.5	.010
C 1026	74576	8 39.6	−38 32	6.6	K5	.44	6.4	.091
2343	74591	8 39.7	+ 6 3	6.0	A3n	.00	1.4	.012
2345(B)		8 40.3	− 2 14	7.7	F3	.03	3.2	.013
2346(A)	74688	8 40.3	− 2 14	6.7†	F5	.02	2.9	.017
2348A	74739	8 40.6	+29 8	4.2	G6	.05	0.3	.017
2351	74794	8 41.0	− 1 41	5.8	K0	.05	0.6	.009
2354A	74874	8 41.5	+ 6 47	3.7†	F8	.19	2.7	.063
2354C		8 41.5	+ 6 47	7.8†	F7	.19	3.5	.014
2355	74918	8 41.7	−13 11	4.7†	G4	.03	0.8	.017
BD +45°1641	75117	8 43.0	+45 20	7.6	F4	.05	2.9	.011
20C 490		8 43.0	+36 53	10.5	M1	.56	8.5	.040
BD +45°1643	75172	8 43.3	+45 20	8.6	A8n	.02	2.7	.007
2364	75332	8 44.3	+33 40	6.2	F7	.11	3.6	.030
2367	75486	8 45.1	+62 20	5.7	F0	.02	2.8	.026
2368	75506	8 45.2	+44 6	5.2	G6	.04	0.7	.013
2369	75528	8 45.5	+15 43	6.3	G2	.13	4.0	.035
2370	75558	8 45.6	+16 22	7.2	G3	.03	2.5	.011
2372	75629	8 45.8	−29 5	6.0	G7	0.03	0.3	.007
ADS 7067A	75632	8 46.0	+71 11	9.3†	M1	1.39	8.5	.069
ADS 7067B		8 46.0	+71 11	9.5	M1	1.39	8.5	.063
2375	75691	8 46.3	−27 20	4.2	K4	0.16	−0.1	.014
BD +12°1927	75700	8 46.4	+12 15	7.8	K2	.04	0.6	.004
2378A	75716	8 46.5	+28 38	6.3	M3	.02	−1.0	.003
2380	75732	8 46.6	+28 43	6.1	K0	.54	5.0	.060
2381A	75737	8 46.7	− 6 48	6.0†	F0	.05	2.4	.019
C 1042	75767	8 46.8	+ 8 27	6.9†	G1	.31	4.2	.029
2383	75958	8 48.0	+64 59	5.9†	G3	.09	0.9	.010
2384A	75959	8 48.1	+30 57	6.1†	G7	.05	0.5	.008
2384B		8 48.1	+30 57	6.6	K1	.05	0.7	.007
2385	75972	8 48.2	+65 54	7.4	G6	.03	0.5	.004
ADS 7082A	76095	8 49.0	+26 36	7.0†	G1	.44	4.5	.032
2391	76219	8 49.7	+28 19	5.2	G6	.04	0.4	.011
2392	76291	8 50.1	+46 1	5.9	K2	.12	0.8	.010
2393	76294	8 50.1	+ 6 20	3.3	G5	.10	0.3	.025
2394	76351	8 50.5	+12 0	5.7	K5	.02	0.1	.008
2401	76572	8 51.9	+30 37	6.2	F3	.07	3.4	.027
BD +21°1947		8 52.1	+20 52	9.1	F2	.00	3.0	.006
2404A	76644	8 52.4	+48 26	3.1	A4n	.50	2.1	.063
2404BC		8 52.4	+48 26	10.8†	M1	.50	8.2	.030
2407A	76756	8 53.0	+12 15	4.3	F0	.05	2.3	.040
2409A	76813	8 53.4	+32 48	5.6	G9	0.06	0.3	0.009

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
2410.....	76830	$8^h53^m.5$	+18°31′	6.6	M4	0″.09	−0.1	0″.005
2411.....	76827	8 53.5	+68 1	5.0	M3	.02	0.0	.010
2412.....	76932	8 54.0	−15 45	5.9	F5	.32	3.5	.033
2413.....	76943	8 54.2	+42 11	4.1	F2	.50	3.3	.069
2415.....	76990	8 54.5	+84 35	6.8†	F2	.02	2.9	.017
ADS 7139A....	77175	8 55.8	+15 40	8.6	K6	.33	7.5	.060
2423.....	77309	8 56.7	+54 41	5.7	A2n	.00	2.1	.019
2425.....	77353	8 56.8	− 0 6	5.8	G8	.09	0.2	.008
C 1070.....	77408	8 57.2	+33 17	7.1	F6	.40	3.5	.019
2430.....	77570	8 58.3	+51 13	6.7	F4	.13	3.3	.021
2432.....	77601	8 58.5	+48 56	5.9†	F1	.02	1.1	.011
2434.....	77800	8 59.6	+67 16	5.3	K5	.05	−0.1	.008
BD +59°1218.....	77818	8 59.7	+59 17	7.6	K0	.17	2.2	.008
2437.....	77912	9 0.2	+38 51	4.7	G5	.04	−0.5	.009
CD −31°6877.....	77938	9 0.3	−32 3	7.7	M5	.....	−0.1	.003
BD +17°2007.....	77985	9 0.6	+17 31	7.6	G7	.02	0.5	.004
2439.....	77996	9 0.7	+ 5 30	5.4	K2	.02	0.0	.008
2441A....	78154	9 1.6	+67 32	5.0†	F4	.07	3.5	.050
2442A....	78175	9 1.7	+23 23	6.3	F3	.16	2.9	.021
2442B....	.....	9 1.7	+23 23	6.7	F4	.16	3.3	.021
2443.....	78209	9 1.8	+52 0	4.5	F2p*	.13	2.2	.035
2444.....	78235	9 2.0	+30 3	5.4	G7	.03	0.6	.011
BD +59°1221.....	78249	9 2.1	+59 32	7.2	K2	.17	2.2	.010
2446A....	78362	9 2.7	+63 55	5.0†	cF6	.12	−0.5	.008
2447.....	78418	9 2.9	+27 3	6.3†	G3	.40	4.7	.048
ADS 7198A....	78391	9 2.9	− 6 44	8.4	F9	.14	3.5	.010
2448.....	78479	9 3.4	+17 52	7.4	K4	.06	0.3	.004
2449.....	78515	9 3.6	+22 27	5.5†	G9	.01	0.6	.010
CD −31°6936.....	78523	9 3.6	−31 52	8.5	F1	.31	3.1	.008
2450A....	78541	9 3.7	−25 27	4.8	Mo	.04	−0.5	.009
C 1083.....	78558	9 3.8	−14 44	7.3	G1	.55	4.5	.027
2453.....	78668	9 4.4	−11 57	5.8	G6	.02	1.1	.011
2455.....	78715	9 4.6	+22 24	6.1	G5	.01	0.8	.009
2456.....	78732	9 4.7	− 8 23	5.7	G6	.04	0.5	.009
2463A....	79028	9 6.4	+61 50	5.5†	F9	.03	4.0	.050
2464.....	79096	9 6.8	+15 24	6.4	G7	.58	4.8	.048
ADS 7243A....	79107	9 6.9	+47 24	7.8†	F4	.04	3.7	.015
2466.....	79181	9 7.4	−19 20	5.8	G9	0.08	0.9	.010
2469(A)..	79210	9 7.6	+53 7	7.9	Mo	1.68	9.0	.166
2470(B)..	79211	9 7.6	+53 7	8.0	Mo	1.68	8.7	.138
2474.....	79354	9 8.4	+57 9	5.5	Mo	0.04	0.1	.008
2478.....	79452	9 9.1	+35 3	6.0	G3	.15	2.3	.018
2480.....	79554	9 9.7	+15 21	5.6	K1	.04	0.3	.009
2490.....	79910	9 11.7	− 5 56	5.7†	K4	.00	0.5	.009
ADS 7284AB..	79969	9 12.0	+29 00	7.9†	K4	0.52	6.3	0.048

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
2494A....	80024	$9^h12^m.3$	+35°47′	6.4†	A4n	0″.06	2.0	0″.013
2496.....	80105	9 12.7	−11 33	7.3	G6	.06	0.6	.005
2498.....	80130	9 12.8	+60 12	7.5	K0	.05	0.8	.005
2501.....	80218	9 13.4	+18 8	6.6	F4	.18	3.5	.024
2502A....	80290	9 13.8	+51 41	6.1	F3	.14	3.6	.032
ADS 7307A....	80441	9 14.7	+38 37	6.6†	F3	.05	3.1	.020
ADS 7307B....	.....	9 14.7	+38 37	6.8	F2	.05	3.2	.019
2505A....	80479	9 14.8	−15 25	5.9	K4	.08	0.3	.008
2506.....	80499	9 15.0	−11 33	4.9	G5	.02	0.0	.010
2507.....	80493	9 15.0	+34 49	3.3	M0	.22	−0.2	.020
2508.....	80536	9 15.4	+25 35	7.3	G1	.16	4.3	.025
2511A....	80586	9 15.6	− 9 8	5.0	G9	.03	0.9	.015
C 1104.....	80715	9 16.1	+40 38	8.4†	K3‖	.52	6.2	.036
C 1106.....	80719	9 16.2	−15 11	6.3	F6	.13	2.9	.021
2516.....	80874	9 17.1	−25 32	4.9	M1	.02	0.3	.012
2518.....	80956	9 17.7	+25 37	6.5	G2	.12	1.0	.008
2520.....	81058	9 18.3	+26 21	6.8	K3	.05	0.8	.006
2524A....	81146	9 18.8	+26 37	4.6	K2	.06	0.6	.016
2525.....	81169	9 18.9	−28 24	4.9	G7	.16	0.7	.014
2527.....	81192	9 19.1	+20 13	6.7	G5	.15	3.7	.025
BD +33°1859.....	81299	9 19.7	+33 12	7.9	G5	.04	0.9	.004
2528.....	81361	9 20.0	+17 1	6.3	G9	.08	0.6	.007
2529.....	81420	9 20.4	− 4 41	5.8	K5	.02	0.1	.007
2530.....	81688	9 22.1	+46 2	5.6	G5	.14	1.0	.012
2533A....	81797	9 22.7	− 8 14	2.2	K5	.04	−0.8	.025
2534.....	81799	9 22.7	−21 54	4.9	K3	.25	0.2	.011
2535.....	81809	9 22.8	− 5 38	5.7†	G1	.23	4.2	.050
2536.....	81817	9 22.9	+81 46	4.6	K5	.03	−0.5	.010
2538A....	81858	9 23.1	+ 9 30	5.9†	F8	.06	3.8	.038
2539A....	81873	9 23.2	+ 8 37	5.9	K0	.02	0.6	.009
2540A....	81937	9 23.6	+63 30	3.8	A4n	.12	1.9	.042
BD +34°1998.....	81964	9 23.9	+34 0	7.8	K3	.....	0.2	.003
BD +33°1870.....	81976	9 24.0	+33 45	8.6†	A7s‖	.....	1.6	.004
2541A....	81997	9 24.1	− 2 20	4.8	F4	.13	3.2	.048
2543A....	82087	9 24.7	+34 6	6.0	G8	.06	−0.2	.006
C 1126.....	82106	9 24.7	+ 6 5	7.6	K5	.53	6.8	.069
2546.....	82198	9 25.5	+35 33	5.5	M1	.13	0.2	.009
2547.....	82189	9 25.5	+72 39	5.8	F6	.10	3.3	.032
2548A....	82205	9 25.5	−26 9	5.7	K3	.03	0.4	.009
2549.....	82210	9 25.6	+70 16	4.6	F9	.09	3.7	.066
20C 532.....	.....	9 25.8	+36 46	10.2	M2	.55	9.4	.069
BD +48°1780.....	82287	9 26.0	+48 36	7.9	A4n	.03	1.7	.006
2550.....	82308	9 26.0	+23 25	4.5	K5	.06	0.5	.016
BD +20°2332.....	82309	9 26.1	+20 26	7.4	K3	0.12	0.7	.005
2552A....	82328	9 26.2	+52 8	3.3	F4	1.10	3.3	0.100

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
ADS 7415A....	82372	9^h26^m4	+20°29′	8.3	A9s	0″.12	2.9	0″.008
2555.....	82395	9 26.6	+11 45	5.1	K1	.13	0.6	.013
2556A....	82381	9 26.6	+10 9	5.3	K4	.02	−0.1	.008
2558.....	82434	9 26.8	−40 2	3.6	A7n	.20	2.3	.055
C 1131.....	82443	9 26.9	+27 26	7.1	G9	.28	5.1	.040
2561.....	82522	9 27.4	+36 56	6.4	K4	.06	0.3	.006
2566.....	82635	9 28.1	+36 51	4.6	G6	.03	1.0	.019
2569.....	82734	9 28.6	−20 40	5.2	K0	.03	0.9	.014
2570.....	82741	9 28.8	+40 4	5.0	G8	.03	1.0	.016
BD +8°2243.....	82819	9 29.4	+ 8 38	8.1	M3	.02	−0.5	.002
2572.....	82870	9 29.6	− 5 28	5.7	K1	.06	0.5	.009
2573A....	82885	9 29.7	+36 16	5.5	K0	.77	5.3	.091
2578.....	83069	9 30.8	+31 37	5.7	M2	.04	−0.4	.006
C 1143.....	83186	9 31.5	+72 12	7.8	F5	.26	3.5	.014
2580.....	83189	9 31.5	+16 53	5.9	K1	.02	0.0	.007
2582.....	83240	9 31.9	+ 7 17	5.4†	G9	.07	0.6	.011
2583.....	83273	9 32.1	+25 7	6.6	F8	.11	3.0	.019
2584.....	83287	9 32.1	+40 41	5.2	A6n	.02	2.0	.023
2585.....	83332	9 32.5	−24 51	5.9	K1	.08	0.7	.009
2586.....	83343	9 32.6	+14 48	6.6	F2	.12	3.0	.019
2589.....	83425	9 33.2	+ 5 6	4.8	K3	.18	0.2	.012
2591.....	83489	9 33.7	+69 42	5.7	G9	.09	0.7	.010
2592.....	83506	9 33.8	+72 42	5.4	G7	.04	−0.3	.007
2595.....	83618	9 34.7	− 0 41	4.1	K3	.08	0.4	.018
2597A....	83698	9 35.2	+39 24	7.3†	G2	.17	4.3	.025
2601.....	83805	9 35.8	+40 13	5.5	G6	.08	0.1	.008
2602A....	83808	9 35.8	+10 21	4.5†	cF5	.15	−0.8	.009
2603.....	83821	9 35 9	+26 22	6.4	K2	.05	0.4	.006
C 1153.....	84035	9 37.1	+43 10	8.1	K6	.82	7.2	.066
2609.....	84117	9 37.7	−23 28	5.0	F7	.47	3.8	.057
2611.....	84179	9 38.2	+64 7	6.5	A7n	.04	1.9	.012
2612.....	84194	9 38.3	+14 29	5.6	M2	.01	−0.3	.007
2614.....	84335	9 39.4	+57 35	5.4	M3	.02	−0.5	.007
2615.....	84367	9 39.7	−27 19	5.0	F7	.06	2.1	.026
2617.....	84406	9 39.9	+63 43	6.9	K0	.19	2.5	.013
2618.....	84441	9 40.2	+24 14	3.1	cG3	.05	−1.3	.013
2620.....	84453	9 40.3	+45 35	6.8	K0	.16	2.1	.011
2621.....	84542	9 40.9	+ 7 10	6.0	M1	.04	−0.1	.006
2622.....	84561	9 41.0	+12 16	5.9	K4	.02	0.1	.007
2623.....	84607	9 41.2	+ 2 15	5.7	F0	.07	2.1	.019
2624.....	84722	9 42.1	+12 2	6.4	A3n	.06	2.2	.014
2626.....	84737	9 42.1	+46 29	5.2	G0	.24	3.8	.052
C 1163.....	84937	9 43.5	+14 14	8.3	A4sp*	.83	4.9	.021
2632A....	84999	9 43.9	+59 31	3.9	A6n	.33	1.5	.033
2633.....	85029	9 44.1	+40 6	6.8	M2	0.02	−0.4	0.004

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	2634	85040	9^h44^m2	+21°39′	6.5†	A8s‖	0″.05	1.7	0″.011
	2636	85217	9 45.3	+ 4 49	6.7†	F6	.16	3.0	.018
	2637A	85235	9 45.3	+54 32	5.0†	A3s	.01	1.3	.018
	2639	85268	9 45.6	+13 32	6.7	Mo	0.04	−0.3	.004
C	1167	.....	9 46.2	−11 49	10.1	M2	1.85	9.5	.076
	2644	85373	9 46.3	+38 23	7.0†	A3n	0.06	2.1	.010
	2645	85444	9 46.7	−14 23	4.3	G6	.03	0.5	.017
	2648	85503	9 47.1	+26 29	4.1	K3	.23	0.5	.019
20C	553	.....	9 48.8	+63 16	9.1	M1	.69	8.9	.091
	2654	85762	9 48.9	+ 5 25	7.0	Mo	.03	−0.1	.004
	2656	85841	9 49.5	+73 21	6.0	K3	.08	0.5	.008
	2657	85859	9 49.7	−25 28	5.0	K3	.21	1.2	.017
BD	+0°2582	85904	9 49.9	+ 0 17	8.1	M4	.08	−0.4	.002
	2658	85951	9 50.2	−18 32	5.2	M1	.05	0.2	.010
	2660	85945	9 50.3	+57 54	6.0	G5	.07	0.5	.008
	2662	86012	9 50.7	+32 51	6.6	F3	.04	2.9	.018
	2663	86080	9 51.1	+ 9 24	5.9	K2	.09	0.3	.008
	2665	86146	9 51.6	+41 32	5.5†	F5	.12	3.0	.032
	2668	86322	9 52.6	+75 14	7.1	Ko	.07	0.2	.004
	2670	86359	9 52.8	+15 42	7.6	G7	.04	2.3	.009
	2671	86369	9 52.8	+ 8 47	6.3	K3	.04	0.0	.005
	2673	86378	9 53.0	+57 17	6.0†	K5	.05	0.5	.008
	2675	86513	9 53.8	+30 7	5.9	G9	.11	0.3	.008
	2677	86564	9 54.2	−28 50	7.3	G5	.01	0.2	.004
C	1189	86661	9 54.9	+56 5	8.3	Ko	.50	5.4	.026
	2680	86663	9 54.9	+ 8 31	4.9	M2	.04	−0.1	.010
	2681	86728	9 55.2	+32 25	5.6	G4	.68	4.8	.069
C	1192	86839	9 56.1	+71 21	8.3	G2	.24	4.3	.016
ADS	7621A	87127	9 57.9	+38 30	6.8	F7	.17	3.0	.017
	2684	87141	9 58.0	+54 23	5.7	F4	.02	3.1	.030
	2685	87301	9 59.0	+ 3 41	6.4	F3	.13	2.8	.019
ADS	7632A	87443	9 59.9	+31 34	8.4†	A9n	.04	2.5	.007
	2693	87682	10 1.6	+ 6 6	6.3	G6	.04	0.7	.008
	2696A	87837	10 2.6	+10 29	4.6	K5	.12	0.2	.013
	2698B	87884	10 2.9	+12 29	7.6	K1	.25	5.5	.038
ADS	7655A	87998	10 3.6	−19 15	7.2	F8	.36	3.9	.022
	2700	88048	10 4.0	+ 6 40	6.8	K4	.02	0.5	.005
	2701	88161	10 5.0	+41 9	6.5	K3	.02	0.2	.005
	2704	88218	10 5.2	−35 22	6.3	F9	.44	3.7	.030
	2705	88215	10 5.2	−12 19	5.4	A9n	0.18	2.0	.021
C	1218	88230	10 5.3	+49 58	6.8	Mo	1.45	8.3	.200
	2706A	88284	10 5.7	−11 52	4.1†	G9	0.22	0.1	.016
	2708	88333	10 6.0	− 7 56	5.8	K2	.05	0.4	.008
C	1222	88371	10 6.3	+24 15	8.6	G2	.41	4.5	.015
	2711A	88355	10 6.3	+13 51	6.8†	F3	0.07	3.3	0.020

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
BD +51°1585	88512	10h 7m.4	+51° 0′	6.9†	A6n	0″.01	2.2	0″.011
BD − 9°3017	88517	10 7.4	− 9 49	8.5	M6	.....	−0.2	.002
C 1225	233719	10 7.5	+53 1	9.2	Mo	.75	7.8	.052
BD +51°1586	233720	10 7.5	+50 48	7.9	G8	.04	0.7	.004
2714	88547	10 7.6	+ 5 7	5.9	Ko	.06	0.4	.008
20C 567	.....	10 7.9	+10 6	9.8	K5	.63	6.3	.020
2717	88697	10 8.8	− 6 53	7.3	F6	.19	3.2	.015
C 1229	88725	10 8.9	+ 3 39	7.7	Go	.46	4.0	.018
2718	88742	10 9.0	−32 32	6.4	Go	.36	4.6	.044
2719	88764	10 9.2	− 7 30	7.1	G7	.04	1.1	.006
2720	88786	10 9.3	+31 58	6.6	G3	.05	0.5	.006
2727	88986	10 10.8	+29 11	6.5	Go	.11	4.0	.032
ADS 7704AB	88987	10 10.8	+18 14	7.3†	F2	.01	2.8	.013
2728(B)	89010	10 11.0	+24 0	5.9	G2	.21	4.2	.046
2730(A)	89025	10 11.1	+23 55	3.9†	Fo	.03	1.3	.030
2731	89056	10 11.3	+14 14	5.7	M1	.04	0.0	.007
2734A	89125	10 11.7	+23 36	5.8	F3	.42	4.0	.044
2735	89254	10 12.7	− 7 34	5.4	F1	.16	1.6	.017
2736	89269	10 12.8	+44 33	6.7	G5	.31	4.4	.035
ADS 7721A	89376	10 13.7	+21 4	9.3†	K5	.17	6.7	.030
BD +15°2188	89396	10 13.9	+15 10	8.5	K5	.06	0.5	.003
2740	89414	10 14.1	+54 43	6.2	K3	.02	0.1	.006
C 1244	.....	10 14.2	+20 22	9.4	M4e	.49	11.0	.209
2741	89449	10 14.3	+19 59	5.0	F5	.33	3.3	.046
2742(A)	89484	10 14.5	+20 21	2.6	K1	.34	0.3	.035
2743(B)	89485	10 14.5	+20 21	3.8	G5	.35	1.1	.029
C 1246	89668	10 15.7	− 0 58	9.4	Mo	.68	8.1	.055
C 1247	89707	10 16.0	−14 59	7.0	F5	.34	3.8	.023
2750	89744	10 16.2	+41 44	5.9	F6	.19	3.5	.033
2751	89758	10 16.4	+42 0	3.5†	K5	.08	−0.1	.019
20C 576	89777	10 16.5	−16 32	9.1	K1	.54	5.7	.021
ADS 7744A	89906	10 17.4	+15 51	7.4	G2	.29	4.8	.030
2757	89962	10 17.8	+ 7 3	6.6†	K3	.11	0.7	.007
2759	90043	10 18.4	− 0 24	6.6	Ko	.06	1.4	.009
2761	90040	10 18.4	+34 13	5.8	K1	.03	0.5	.009
2762	90089	10 18.9	+83 4	5.3	F1	.08	3.4	.042
2765	90250	10 20.0	+35 56	6.6	Ko	.14	0.9	.007
2766	90254	10 20.0	+ 9 18	5.9	M3	.04	0.0	.007
2768	90277	10 20.2	+34 18	4.8	F3	.11	2.1	.029
2770	90362	10 20.7	− 6 33	5.8	M1	.19	−0.5	.005
2771	90432	10 21.3	−16 20	4.1	K5	.15	0.5	.019
2772	90473	10 21.5	− 0 29	6.8	K2	.05	0.7	.006
ADS 7778A	90483	10 21.7	+18 35	8.7	G5	.15	4.4	.014
ADS 7778B	.....	10 21.7	+18 35	8.7	G5	.15	4.3	.013
2774	90485	10 21.7	− 3 53	6.6	G7	0.07	0.3	0.005

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
2775.....	90508	10h21m9	+49°19′	6.5	G2	0″.90	4.4	0″.038
2776A....	90537	10 22.1	+37 13	4.4	G8	.16	0.6	.017
ADS 7779A....	90572	10 22.3	+ 4 4	7.4†	G9	.15	2.2	.009
2780.....	90633	10 22.8	+66 8	6.4	K2	.04	0.9	.008
C 1264.....	90711	10 23.2	− 6 5	8.1	Ko	.48	5.2	.026
BD +30°2021.....	90717	10 23.4	+30 15	6.7	K1	.03	0.8	.007
2782.....	90718	10 23.5	+14 51	7.1	G5	.08	1.3	.007
2785.....	90839	10 24.2	+56 30	4.8	F8	.18	3.5	.055
2789.....	90957	10 24.9	−29 9	6.1†	K5	.07	0.4	.007
2793.....	91011	10 25.3	+ 2 40	7.1	Ko	.08	2.2	.010
20C 582.....	.....	10 25.5	+46 3	8.8	M1	.84	8.2	.076
2795.....	91075	10 25.7	+81 1	6.6	G4	.02	0.9	.007
2796A....	91106	10 26.0	− 7 7	6.4	Mo	.04	0.2	.006
BD +30°2031.....	91163	10 26.4	+30 14	7.8	F8	.09	3.4	.013
2799.....	91190	10 26.6	+76 14	5.0	G7	.03	0.7	.014
2800.....	91232	10 26.9	+14 39	5.7	M2	.04	−c.6	.005
2801.....	91256	10 27.1	+ 5 10	7.2	G9	.03	1.0	.006
2802A....	91312	10 27.4	+40 56	4.8	A4n	.14	1.8	.025
2806.....	91347	10 27.7	+49 42	7.6	F8	.29	3.8	.017
2813.....	91480	10 28.7	+57 36	5.2	A9s	.07	2.7	.032
2815A....	91550	10 29.3	−23 14	5.3	K4	.01	0.1	.009
2816.....	91612	10 29.6	+ 7 28	5.2	G6	.12	0.8	.013
2818.....	91706	10 30.2	−22 40	6.2	F5	.11	2.9	.022
2819.....	91752	10 30.6	+36 51	6.2	F3	.05	3.4	.027
2821A....	91880	10 31.4	−15 50	6.5†	M1	.03	−0.4	.004
ADS 7846A....	91881	10 31.4	−26 9	6.5†	F3	.....	3.1	.021
2822.....	91889	10 31.6	−11 42	5.8	F5	.73	3.8	.040
2824.....	92000	10 32.2	+34 36	6.9†	K2	.03	0.3	.005
2825.....	92036	10 32.5	−26 54	5.1	M2	.11	−0.1	.009
2828.....	92095	10 32.9	+54 11	5.7	K3	.12	0.4	.009
2829.....	92125	10 33.1	+32 30	4.8	cG2	.01	−1.6	.005
2831.....	92168	10 33.4	+38 26	6.1†	F8	.23	3.3	.027
2832.....	92196	10 33.5	+16 39	6.6	F2	.05	3.1	.020
2836.....	92214	10 33.7	−16 21	5.4†	Ko	.11	1.0	.013
ADS 7873A....	92321	10 34.5	+38 55	8.0	K5	.03	0.3	.003
ADS 7873B....	.....	10 34.5	+38 55	8.5	K3	.03	0.6	.003
ADS 7871A....	92323	10 34.5	+ 9 22	8.1†	F6	.10	3.0	.010
2838.....	92354	10 34.7	+68 58	5.9	K3	.04	0.2	.007
2841.....	92424	10 35.1	+66 14	5.1	K4	.18	1.2	.017
2844.....	92523	10 35.9	+69 36	5.2	K4	.02	−0.1	.009
C 1290.....	92538	10 35.9	+66 32	8.7	Go	.21	3.6	.010
2846.....	92588	10 36.3	− 1 13	6.4	K1	.19	2.5	.017
2847.....	92620	10 36.6	+32 13	6.3	M5	.03	0.0	.005
BD + 1°2471.....	92706	10 37.2	+ 1 23	7.6	K2	.01	0.7	.004
2851A....	92749	10 37.5	+ 4 6	6.8†	F5	0.10	3.2	0.019

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
2853(A)..	92787	10h37m7	+46°44′	5.3	Fo	0″.29	2.5	0″.027
BD +47°1806.....	.....	10 38.1	+46 49	9.9	G1	.15	4.3	.008
2857(B)..	92855	10 38.1	+46 44	8.4†	Go	.28	3.9	.013
2858A....	92841	10 38.2	+ 5 16	6.0	K4	.04	0.2	.007
2858B....	.....	10 38.2	+ 5 16	7.1	G7	.04	0.8	.005
BD +33°2022.....	92940	10 38.8	+33 9	7.6	A8s	.03	2.2	.008
ADS 7914A....	93013	10 39.4	+45 30	8.2†	G7	.04	1.1	.004
2864.....	93102	10 40.0	+ 3 1	6.6	K4	.05	0.4	.006
2865.....	93132	10 40.1	+57 54	6.5	M2	.08	0.3	.006
BD +44°2012.....	93213	10 40.7	+44 38	8.0	F4	.16	3.6	.013
2868.....	93244	10 40.9	+ 6 54	6.3	K1	.04	0.4	.007
2869.....	93257	10 41.0	+19 25	5.6	K3	.10	0.4	.009
2870.....	93291	10 41.1	+14 43	5.6	G4	.15	0.9	.011
2872.....	93410	10 42.0	−25 31	6.9	G7	.18	1.1	.007
2877.....	93527	10 42.7	−15 6	7.4	F2	.13	3.4	.016
2881.....	93636	10 43.4	+29 57	6.3	K1	.10	2.0	.014
2882.....	93704	10 44.0	− 8 34	7.2	G4	.03	1.0	.006
2887.....	93765	10 44.4	+28 30	6.1	A8n	.02	2.2	.017
2888.....	93813	10 44.7	−15 40	3.3	K3	.21	0.4	.026
2890.....	93859	10 45.0	+57 7	5.8	K1	.07	0.4	.008
2891.....	93875	10 45.1	+59 51	5.7	K2	.06	0.7	.010
C 1307.....	94028	10 46.1	+20 49	8.1	F1	.50	3.6	.013
2896.....	94084	10 46.5	+53 2	6.6	Ko	.09	0.6	.006
2897.....	94132	10 46.7	+70 23	6.1	G9	.43	4.4	.046
BD +33°2049.....	94178	10 47.1	+33 31	7.6	G7	.05	2.4	.009
2898.....	94247	10 47.5	+55 7	5.4	K2	.07	0.3	.010
2899.....	94264	10 47.7	+34 45	3.9	K2	.30	2.2	.046
2902A....	94388	10 48.6	−19 36	5.3	F6	.25	3.2	.038
2903.....	94402	10 48.6	− 1 36	5.7	G6	.09	0.7	.010
ADS 7974A....	94469	10 49.2	+21 18	8.4	F1	.02	2.9	.008
2904.....	94480	10 49.3	+26 1	6.2	A5n	.06	1.9	.014
2906.....	94481	10 49.3	−13 14	5.8	G4	.03	0.8	.010
2907.....	94497	10 49.4	+34 34	5.9	G7	.09	0.9	.010
2910.....	94600	10 50.2	+34 2	5.2	K1	.11	0.5	.011
2912.....	94669	10 50.5	+42 33	6.1	K1	.10	0.6	.008
2913A....	94672	10 50.6	+ 1 16	6.0	F3	.10	2.9	.024
2914.....	94671	10 50.6	+18 41	7.6†	G4	.07	1.2	.005
2915.....	94705	10 50.8	+ 6 43	6.0	M5	.02	−0.9	.004
C 1325.....	94718	10 50.9	+28 17	8.6	G6	.47	4.9	.018
2916A....	94738	10 51.0	+ 0 58	6.9	K3	.01	0.1	.004
20C 599.....	.....	10 51.4	+42 25	9.6	K3	.79	6.3	.022
2918.....	94860	10 52.0	+78 18	6.3	G7	.08	0.5	.007
BD + 0°2718.....	94864	10 52.0	+ 0 14	6.9	F4	.12	2.8	.015
2920.....	95128	10 53.9	+40 58	5.1	Go	.32	4.2	.066
2921.....	95129	10 54.0	+36 38	6.2	M2	0.10	0.0	0.006

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
2922.....	95212	10h54m.5	+46° 4′	5.7	K5	0″.02	0.4	0″.009
2924.....	95241	10 54.7	+43 27	6.1	G0	.18	3.5	.030
2925.....	95272	10 54.9	−17 46	4.2	K1	.48	0.7	.020
2926.....	95310	10 55.2	+39 45	5.1	A7s	.07	1.6	.020
2927.....	95345	10 55.4	+ 4 9	5.0	K3	.02	0.3	.011
CD −25°8383.....	95405	10 55.7	−25 19	9.0	K3	.04	0.4	.002
2930.....	95418	10 55.8	+56 55	2.4	A2s	.09	0.7	.046
BD + 0°2725.....	95453	10 56.0	+ 0 36	7.9	A7s	.05	1.7	.006
BD +81° 359.....	95544	10 56.6	+81 35	8.3	G4	.22	4.2	.015
2931.....	95578	10 56.7	− 1 57	5.3†	M1	.04	0.1	.010
ADS 8022A....	95577	10 56.8	+15 9	8.9	F4	.08	3.2	.007
2933A....	95689	10 57.6	+62 17	2.3†	G7	0.14	0.0	.035
2935.....	95735	10 57.9	+36 38	7.6	M2	4.77	10.7	.417
2937A....	95808	10 58.3	−10 46	5.6	G6	0.14	0.9	.011
2938.....	95849	10 58.5	+ 0 32	6.2	K3	.07	0.6	.008
C 1347.....	95955	10 59.0	+66 21	8.5	K4	.26	6.6	.042
2940A....	95934	10 59.0	+38 47	6.1	A6n	.07	2.3	.017
2941.....	95976	10 59.2	+38 47	7.4	F5	.09	3.3	.015
BD +66° 697.....	96074	10 59.8	+66 25	7.7	G8	.03	2.4	.009
2942A....	96097	10 59.9	+ 7 53	4.7	F3	.35	2.1	.030
2943.....	96094	10 59.9	+25 45	7.5	G0	0.40	4.1	.021
C 1349.....	.....	11 0.5	+44 2	8.6	M2	4.54	10.1	.200
2947.....	96202	11 0.5	−26 45	5.1	F4	0.20	3.0	.038
2949.....	96418	11 1.7	+26 5	6.7	F6	.07	3.2	.020
2950A....	96436	11 1.8	+ 2 30	5.7	G7	.38	2.6	.024
C 1353.....	96511	11 2.2	+82 17	7.4†	G3	.23	4.8	.030
ADS 8065A....	96527	11 2.2	+53 22	7.6†	F9	.08	4.1	.020
2954.....	96616	11 2.7	−42 6	5.3	A5sp*	.08	1.2	.015
C 1356.....	96700	11 3.2	−29 38	6.5	G1	.55	4.1	.033
2958.....	96833	11 4.0	+45 2	3.2	K1	.07	0.5	.029
βGC 5691C....	96972	11 4.8	+66 35	8.8	G7	.00	1.3	.003
βGC 5691A....	97033	11 5.2	+66 34	9.0	G5	.36	3.7	.009
ADS 8083A....	97101	11 5.6	+31 0	8.8	M1	.62	8.7	.096
ADS 8083B....	.....	11 5.6	+31 0	10.4	M2	.62	10.3	.096
ADS 8083C....	97100	11 5.6	+31 0	9.0	G5	.06	2.5	.005
BD +59°1353.....	97140	11 5.8	+59 27	7.3	F9	.05	3.7	.019
C 1364.....	97233	11 6.4	−14 26	9.0	M0	.92	8.0	.063
2967AB..	97561	11 8.4	+20 41	7.7†	G4	.42	4.1	.019
2971A....	97584	11 8.6	+74 1	7.8	K5	.41	6.4	.052
2971B....	.....	11 8.6	+74 1	8.3	M0	.01	0.2	.002
2972A....	97603	11 8.8	+21 4	2.6	A2n	.21	2.1	.079
2973.....	97605	11 8.8	+ 8 36	5.9	K3	.13	0.7	.009
2974.....	97633	11 9.0	+15 59	3.4	A4s	.11	1.0	.033
2976.....	97778	11 9.9	+23 38	4.9	M2	.02	−1.0	.007
2977A....	97855	11 10.3	+53 19	6.3	F2	0.18	3.7	0.030

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	2978.....	97907	11h10m6	+13°51′	5.8†	K3	0″.03	0.4	0″.008
	2979.....	97937	11 10.7	+13 23	6.5	A6n	.09	1.9	.012
	2980.....	97989	11 11.1	+50 1	6.0	Ko	.09	1.0	.010
	2983.....	98118	11 12.1	+ 2 34	5.4	Mo	.16	0.6	.011
C	1375.....	.....	11 12.2	− 1 26	9.7	K6	.53	7.6	.038
	2984A....	98231	11 12.9	+32 6	5.1†	Go	.73	4.3	.069
	2984B....	98230	11 12.9	+32 6	5.6†	Go	.73	4.6	.063
	2985A....	98262	11 13.1	+33 38	3.7	K3	.03	−0.1	.017
	2986.....	98281	11 13.2	− 4 31	7.3	G5	.81	4.8	.032
ADS	8128A....	98354	11 13.8	+14 49	6.9†	F7	.16	4.3	.030
	2988.....	98366	11 13.8	+ 2 12	6.0	Ko	.08	0.6	.008
ADS	8131A....	98427	11 14.3	− 1 6	6.6	F6	.27	3.8	.027
ADS	8131B....	.....	11 14.3	− 1 6	7.6	G6	.27	4.4	.023
	2989.....	98430	11 14.3	−14 14	3.8	Ko	0.23	0.8	.025
C	1383.....	.....	11 14.8	+66 23	9.3	M1	2.99	9.2	.096
ADS	8140A....	98736	11 16.6	+18 44	8.2†	Ko	0.18	5.4	.027
20C	630.....	.....	11 17.1	+15 0	10.3	Ko	.57	5.6	.011
	2994.....	98824	11 17.3	+17 59	7.0	K2	.10	0.1	.004
	2995.....	98839	11 17.3	+44 2	5.1	G7	.04	0.1	.010
	2997.....	98991	11 18.4	−18 14	5.5†	F3	.31	2.2	.022
	2999A....	99028	11 18.7	+11 5	4.0	F4	.18	2.6	.052
	2999B....	.....	11 18.7	+11 5	6.8	F5	.18	3.1	.018
	3000.....	99055	11 18.9	+ 1 57	5.5	G7	.03	0.8	.011
	3002.....	99167	11 19.6	−10 19	5.1	Mo	.04	−0.2	.009
	3004.....	99196	11 19.8	+11 59	6.0	K4	.12	0.2	.007
	3007.....	99283	11 20.3	+56 24	5.8	G6	.07	0.9	.010
	3008A....	99285	11 20.4	+17 0	5.6	F2	.14	3.0	.030
	3011.....	99329	11 20.7	+ 4 25	6.7†	A8n	.09	2.1	.012
	3014(A)..	99491	11 21.7	+ 3 33	6.2	Ko	.74	5.2	.063
	3015(B)..	99492	11 21.7	+ 3 33	7.6	K5	.74	6.2	.052
	3017.....	99564	11 22.1	−11 48	6.0	F4	.11	3.0	.025
	3020.....	99651	11 22.8	− 1 9	6.3	K2	.04	0.2	.006
	3021A....	99648	11 22.8	+ 3 24	5.2	G7	0.03	0.0	.009
C	1412.....	.....	11 23.3	+ 8 6	9.7	G7	1.21	5.3	.013
	3022.....	99747	11 23.4	+62 19	5.9	F1	0.27	3.0	.026
	3025.....	99902	11 24.5	+15 58	6.0	K4	.07	0.2	.007
	3026B....	.....	11 24.7	−23 55	7.7	F1	.05	3.3	.013
	3028.....	99984	11 25.1	+43 43	5.9	F5	.09	3.3	.030
	3029.....	99998	11 25.2	− 2 27	5.1	K5	.03	0.5	.012
	3030.....	100006	11 25.3	+18 58	5.7	Ko	.08	1.0	.011
ADS	8189A....	100018	11 25.4	+41 50	8.1†	F1	.13	3.2	.010
	3031.....	100029	11 25.5	+69 53	4.1	Mo	.04	−0.3	.013
	3032A....	100180	11 26.6	+14 55	6.2	F7	.38	4.0	.036
	3032B....	.....	11 26.6	+14 55	9.0	K6	.38	7.5	.050
	3033A....	100203	11 26.7	+61 38	5.8†	F4	0.08	3.5	0.035

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. m	Sp.	μ	Vis. M	Spec. π
	3034.....	100238	11^h26^m9	− 5°55′	7.3†	K1	0″.10	0.6	0″.005
C	1421.....	100255	11 27.1	+29 36	7.8	F2	.12	3.3	.013
	3037(B)..	100286	11 27.3	−28 43	5.9	F7	.14	3.4	.032
	3038(A)..	100287	11 27.3	−28 43	5.8	F6	.14	3.6	.036
	3039.....	100343	11 27.7	− 7 17	6.2	K4	.02	0.3	.007
	3042.....	100407	11 28.1	−31 18	3.7	G7	.21	0.4	.022
C	1426.....	100446	11 28.4	+65 48	7.2	F5	.20	3.7	.020
	3044.....	100563	11 29.2	+ 3 37	5.8	F5	.22	3.4	.033
	3046.....	100615	11 29.6	+55 20	5.8	G8	0.01	0.7	.010
	3047.....	100623	11 29.6	−32 18	6.1	K2	1.06	5.8	.087
	3050.....	100696	11 30.2	+69 53	5.4	G6	0.18	0.8	.012
	3058.....	100920	11 31.8	− 0 16	4.5	G8	.04	0.3	.014
	3059.....	100949	11 32.0	−22 24	6.7	Ko	.07	0.9	.007
	3063.....	101107	11 33.0	+44 11	5.5	A7n	.15	2.0	.020
	3066A....	101154	11 33.3	− 1 53	6.2	K1	.04	0.1	.006
	3067.....	101153	11 33.3	+ 8 41	5.5	M6	.01	0.2	.009
	3069A....	101177	11 33.5	+45 40	6.6†	G1	.59	4.2	.033
	3069B....	.....	11 33.5	+45 40	8.7†	K5	.59	6.6	.038
	3070.....	101198	11 33.6	−12 39	5.6	F5	.14	3.4	.036
20C	654.....	101206	11 33.7	+42 52	8.3†	K5	.46	6.9	.052
C	1437.....	101227	11 33.8	+44 51	8.3†	G4	.28	5.3	.025
BD	+45°1951....	101300	11 34.4	+45 5	8.2	A8n	.01	1.9	.005
	3074.....	101484	11 35.6	+21 54	5.4	K1	.08	0.6	.011
	3075.....	101501	11 35.8	+34 46	5.5	G6	.39	5.2	.087
	3077.....	101563	11 36.2	−28 39	6.8†	Go	.38	3.9	.026
BD	+45°1955....	101585	11 36.3	+44 45	7.8	M3	.02	−0.2	.003
	3078.....	101606	11 36.4	+32 18	5.7	F1	.35	3.6	.038
BD	+68° 658....	101656	11 36.8	+68 45	9.1	G4	.67	4.4	.011
	3081.....	101673	11 36.9	+67 18	5.5	K2	.06	0.1	.008
	3083.....	101853	11 38.3	+42 17	6.8	G8	.03	0.7	.006
	3086.....	101933	11 38.8	− 6 7	6.2	G8	.08	0.7	.008
C	1449.....	101967	11 39.0	+45 3	7.8	F4	.22	3.2	.012
	3087.....	102070	11 39.7	−17 48	4.9	G8	.05	0.6	.014
C	1452.....	102158	11 40.3	+48 14	8.0	F9	.65	3.8	.014
	3089.....	102212	11 40.7	+ 7 5	4.2	M1	.19	−0.5	.011
	3090.....	102224	11 40.8	+48 20	3.8	K1	.14	0.4	.021
	3093.....	102328	11 41.6	+56 11	5.4	K3	0.04	0.6	.011
	3095.....	102365	11 41.7	−39 57	5.0	G4	1.57	5.2	.110
	3098A....	102509	11 42.8	+20 46	4.8†	F4	0.16	3.4	.052
ADS	8311A....	102590	11 43.5	+14 50	5.9	A6n	.12	2.3	.019
	3100.....	102620	11 43.7	−26 12	5.4	M4	.03	−0.5	.007
	3101A....	102647	11 44.0	+15 8	2.2	A4n	.51	2.1	.096
	3105.....	102870	11 45.5	+ 2 20	3.8	F8	.79	4.0	.110
	3108.....	102928	11 45.9	− 4 47	6.1†	Ko	0.01	2.2	.017
BD	+34°2264....	102942–3	11 46.0	+33 56	6.4†	F1‡	.....	2.1	0.014

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
3110.....	103026	11h46m6	−30°16′	6.0	F5	0″.31	3.4	0″.030
3112.....	103095	11 47.2	+38 26	6.5	G5	7.04	6.3	.091
BD +87° 99.....	103126	11 47.4	+86 47	9.1	K0	0.34	5.6	.020
ADS 8337A....	103246	11 48.3	+74 19	7.1†	F7	.09	3.5	.019
BD +14°2447.....	103311	11 48.7	+14 35	8.1	F0	.03	2.8	.009
3118.....	103327	11 48.8	− 3 13	7.3	G6	.07	4.1	.023
βGC 5960A....	103432	11 49.4	+19 58	8.4	G6	.45	4.8	.019
βGC 5960B....	103431	11 49.5	+19 59	8.4	G7	.44	5.2	.023
3119.....	103462	11 49.6	−25 10	5.5	G4	.08	1.1	.013
3121.....	103484	11 49.9	+ 9 0	5.6	K0	.03	1.0	.012
3123A....	103578	11 50.5	+16 12	5.8†	A4s	.02	1.2	.012
3124.....	103596	11 50.6	−27 55	6.1	K5	.03	0.1	.006
3125.....	103605	11 50.8	+57 9	5.9	K0	0.01	0.5	.008
C 1487.....	103932	11 53.0	−27 8	7.2	K6	1.24	7.0	.091
3128.....	103945	11 53.1	+ 4 2	6.9	M4	0.01	−0.9	.003
3132A....	104055	11 53.9	+ 1 5	6.5	K3	.07	−0.1	.005
3136.....	104216	11 55.1	+81 25	6.4	M4	.07	−1.0	.003
3137.....	104304	11 55.6	− 9 53	5.6	G7	.49	4.7	.066
3140.....	104356	11 55.9	− 1 13	6.4	G8	.08	0.3	.006
3141.....	104438	11 56.5	+36 36	5.6	K1	.14	0.5	.010
3142.....	104452	11 56.6	+22 39	6.6	F6	.04	1.8	.011
3145.....	104556	11 57.4	+43 39	6.8	G9	.62	4.5	.035
BD +30°2217.....	104710	11 58.4	+30 14	7.7	M5	.03	−0.1	.003
3148.....	104731	11 58.5	−41 52	5.3	F4	.34	3.1	.036
3149.....	104755	11 58.6	+ 6 7	6.5	F2	.17	3.2	.022
C 1492.....	104800	11 59.0	+ 3 55	9.3	G0	.57	3.2	.006
3150A....	104827	11 59.2	+22 1	6.1†	A8s	.04	2.1	.016
3150B....	.....	11 59.2	+22 1	7.5	F2	.04	2.9	.012
3154.....	104904	11 59.7	+86 8	6.4	F6	.11	2.5	.017
3155.....	104979	12 0.1	+ 9 17	4.2	G5	.22	1.1	.024
C 1497.....	104988	12 0.1	− 0 57	8.4	K0	.53	5.4	.025
3156.....	104985	12 0.2	+77 28	6.0	G8	.17	0.7	.009
3157A....	105043	12 0.6	+63 30	6.2	K2	.09	0.6	.008
3158.....	105089	12 0.9	− 2 34	6.5	G8	.05	0.6	.007
ADS 8419AB..	105122	12 1.0	+69 15	7.8†	F5	.06	3.0	.011
BD +28°2077.....	105101	12 1.0	+28 7	9.7	F9	.09	3.1	.005
BD + 0°2897.....	105390	12 3.0	+ 0 11	8.9	F4	.07	2.9	.006
ADS 8434B....	105422	12 3.1	+56 1	8.4	G1	.18	4.3	.015
3166.....	105452	12 3.3	−24 10	4.2	F2	.09	2.8	.052
ADS 8440A....	105590	12 4.3	−11 18	6.8	G2	.34	4.2	.030
C 1511.....	105631	12 4.6	+40 49	7.4	K1	.32	5.4	.040
3169.....	105639	12 4.6	+ 2 28	6.1	K3	.19	1.8	.014
3171.....	105702	12 5.0	+ 6 22	5.7	F6	.17	1.5	.014
3172.....	105707	12 5.0	−22 4	3.2	K3	.06	0.3	.026
C 1515.....	105791	12 5.6	+66 13	8.7	F1	0.31	3.4	0.009

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
3177A....	105943	12h 6m.5	+82°16′	6.3	K5	0″.02	−0.1	0″.005
ADS 8450A....	105963	12 6.5	+53 59	7.5	K2	.22	6.4	.060
ADS 8450B....	.....	12 6.5	+53 59	7.7	K1	.22	5.9	.044
3179.....	106002	12 6.8	+57 37	6.5	K5	.02	0.1	.005
3180.....	105981	12 6.8	+26 26	6.1†	K4	.06	0.3	.007
3181.....	106057	12 7.1	+21 6	5.7	G8	.03	1.0	.011
C 1522.....	106116	12 7.4	− 2 32	7.4	G6	.74	4.6	.027
C 1523.....	106156	12 7.8	+10 36	8.0	K1	.43	5.3	.029
C 1524.....	106210	12 8.1	+11 24	7.9	G2	.59	4.3	.019
ADS 8470A....	106365	12 9.1	+33 20	6.8	K3	.13	0.7	.006
3186.....	106478	12 9.8	+53 59	6.3	Ko	.02	0.9	.008
ADS 8477A....	106515	12 10.0	− 6 42	7.7†	G5	.27	4.6	.024
ADS 8477B....	.....	12 10.0	− 6 42	7.7	G8	0.32	5.2	.032
C 1533.....	106516	12 10.0	− 9 44	6.1	F3	1.02	3.5	.030
3189.....	106574	12 10.4	+70 45	5.9	K2	0.04	0.4	.008
ADS 8486A....	.....	12 10.9	+ 6 12	10.0	K6	.32	7.4	.030
3193A....	106690	12 11.1	+41 13	5.8	Mo	.05	0.3	.008
3194.....	106714	12 11.3	+24 30	5.1	G8	.03	0.9	.014
3195.....	106760	12 11.5	+33 37	5.4†	Ko	.12	0.5	.010
3196A....	106798	12 11.9	+80 41	7.3	A8n	.03	2.0	.009
C 1536.....	106811	12 11.9	+64 11	8.4	G3	.29	4.2	.014
3198A....	106887	12 12.5	+29 30	5.7	A9n	.06	2.5	.023
BD +15°2441.....	106888	12 12.5	+15 0	8.1	F8	.06	4.2	.017
C 1539.....	106949	12 12.8	+15 35	8.3	F6	.15	3.1	.009
BD +19°2547.....	106972	12 13.0	+19 0	7.5	F5	.03	3.1	.013
3201A....	106976	12 13.0	− 3 24	6.6	F4	.02	3.0	.019
3201B....	106975	12 13.0	− 3 24	7.0	F5	.02	3.2	.017
C 1541.....	107054–5	12 13.5	+30 49	6.1	A7n	.15	2.4	.018
ADS 8506A....	107068	12 13.6	+12 21	8.7	G1	.....	3.0	.007
ADS 8506B....	.....	12 13.6	+12 21	9.2	G1	.....	3.9	.009
3204.....	107113	12 13.9	+86 59	6.3	Fo	.21	3.2	.024
C 1542.....	107146	12 14.1	+17 6	7.0	G3	.24	5.2	.044
BD −15°3450.....	107149	12 14.1	−15 43	7.8	M1	.....	−0.4	.002
3205A....	107161	12 14.2	− 8 22	7.0	Ko	.04	0.6	.005
BD +15°2445.....	107170	12 14.3	+15 7	6.7	G9	.07	0.4	.005
3208.....	107192	12 14.4	+88 15	6.3	Fo	.07	3.0	.022
20C 695.....	.....	12 14.4	+28 56	10.1	M2	.64	8.7	.052
3209.....	107213	12 14.5	+28 43	6.3	F8	.24	3.1	.023
3211.....	107274	12 14.9	+49 32	5.6	M1	.01	−0.8	.005
ADS 8514A....	107288	12 15.0	+14 25	6.9	Ko	.05	0.8	.006
3212A....	107341	12 15.3	+38 27	6.7	G7	.06	0.7	.006
3213.....	107328	12 15.3	+ 3 52	5.1	K1	.31	0.4	.011
3214.....	107325	12 15.3	+27 11	5.7	K2	.14	0.6	.010
3216A....	107383	12 15.7	+18 21	4.9	G6	.14	0.6	.014
3217.....	107418	12 15.8	−13 1	5.4	K3	0.00	0.4	0.010

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. m	Sp.	μ	Vis. M	Spec. π
3219.....	107465	$12^h16^m.0$	+58°25′	5.7	K5	0″.08	0.4	0″.009
C 1551.....	107596	12 16.9	+42 42	9.1	Mo	.57	8.7	.083
BD +17°2469.....	107612	12 17.0	+17 17	6.6	A3sp*	.....	0.6	.006
BD −14°3500.....	107642	12 17.1	−15 0	6.7	K2	.....	0.4	.005
3223A....	107705	12 17.4	+ 5 52	6.5	F7	.18	3.8	.029
3224A....	107700	12 17.5	+26 24	5.1†	F2	.02	2.4	.029
3226.....	107815	12 18.1	−24 17	5.8	K1	.03	0.8	.010
3228A....	107869	12 18.6	−29 47	6.6	Mo	.00	−0.8	.003
3230.....	107950	12 19.2	+52 7	5.3†	G6	.01	0.5	.011
ADS 8539A....	108007	12 19.4	+26 8	6.6†	A6n	.04	1.9	.011
C 1563.....	108081	12 19.9	− 3 40	8.4†	G4	.26	4.6	.017
C 1564.....	108076	12 19.9	+38 52	8.1	F6	.62	3.9	.014
3233.....	108123	12 20.2	+24 29	6.1	K1	.07	0.7	.008
3234.....	108135	12 20.3	+57 20	6.0	M3	.03	0.2	.007
C 1566.....	108153	12 20.4	+32 25	9.3	K4	.46	7.0	.035
3235.....	108225	12 20.9	+39 34	5.2	G4	.09	0.9	.014
3242.....	108381	12 22.0	+28 49	4.6	K3	.12	0.4	.014
ADS 8553A....	108421	12 22.2	+27 35	9.2†	K5	.24	6.4	.027
ADS 8553B....	.....	12 22.2	+27 35	9.5	K6	.24	7.3	.036
BD +42°2307.....	108464	12 22.6	+41 55	7.5†	F3‡	.05	3.1	.013
3246.....	108477	12 22.6	−16 5	6.5	G4	.03	0.1	.005
3247.....	108506	12 22.7	− 4 4	6.3†	A8n	.08	1.6	.011
3248.....	108502	12 22.8	+56 16	5.8	M2	.03	0.6	.009
ADS 8561A....	108574	12 23.2	+45 21	7.4	F8	.31	4.1	.022
ADS 8561B....	108575	12 23.2	+45 21	8.0	G2	.31	4.2	.017
3252.....	108680	12 24.0	− 1 53	7.6	M4	.05	−0.4	.003
3254.....	108722	12 24.4	+24 40	5.5	F2	.02	1.8	.018
C 1579.....	108754	12 24.6	− 2 46	8.7	G6	.70	4.7	.016
3258A....	108799	12 24.9	−12 50	6.4	F8	.25	3.8	.030
3259.....	108821	12 25.1	−23 9	5.9	Mo	.03	−0.2	.006
3261.....	108845	12 25.3	+52 5	6.2	F6	.28	3.3	.026
3262AB..	108875	12 25.5	+10 16	8.5†	F5	.08	2.8	.007
ADS 8576A....	108877	12 25.5	+ 4 4	7.4	G7	.02	0.9	.005
3264.....	108910	12 25.7	− 3 31	7.1	K4	.08	0.0	.004
3265.....	108907	12 25.7	+69 45	5.2	M4	.08	−0.5	.007
3267.....	108954	12 26.1	+53 37	6.2	F7	.18	3.9	.035
BD +17°2489.....	108957	12 26.1	+17 10	7.5	K1	.02	0.8	.005
20C 713.....	.....	12 26.3	+ 9 22	9.7	M1	.84	8.8	.066
ADS 8585B....	.....	12 26.4	−10 31	8.7	F1	.08	2.4	.006
3270.....	109014	12 26.5	− 4 30	6.3	G9	.05	1.0	.009
3272.....	109085	12 26.9	−15 39	4.9†	F2	.44	2.9	.040
3273.....	109141	12 27.4	−13 18	5.7	A9n	.15	1.2	.013
ADS 8591A....	109213	12 28.0	+75 22	7.5	G9	.02	0.8	.005
3274.....	109217	12 28.0	+10 51	6.5	G7	.06	0.7	.007
3275.....	109272	12 28.4	−12 17	5.8	G8	0.05	0.8	0.010

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	3278.....	109317	12h28m.7	+33°48′	5.4	G7	0″.04	0.6	0″.011
	3279.....	109358	12 29.0	+41 54	4.3	Go	.76	4.2	.096
	3280.....	109379	12 29.1	−22 51	2.8	G4	.06	0.0	.027
	3284(B)..	109510	12 30.1	+18 56	7.2†	Ag5	.02	2.5	.011
	3285(A)..	109511	12 30.1	+18 56	5.2	G9	.02	0.4	.011
	3287.....	109551	12 30.5	+70 34	5.5†	K2	.03	0.3	.009
ADS	8606A....	109628	12 31.0	+11 57	9.0†	Go	.30	3.4	.008
ADS	8606B....	.....	12 31.0	+11 57	9.0	Go	.30	4.5	.013
	3288.....	109646	12 31.1	+80 48	7.4	F3	.08	3.1	.014
	3291.....	109742	12 32.0	+17 38	5.8	K5	.05	0.3	.008
	3293A....	109799	12 32.4	−26 35	5.4	F2	.12	3.0	.033
	3294.....	109896	12 33.3	+ 2 24	6.0	M3	.09	0.0	.006
	3295A....	109944	12 33.6	− 3 49	7.2†	Mo	.05	−0.5	.003
	3298.....	110014	12 34.1	− 7 27	4.8	K3	.08	0.3	.013
	3299.....	110024	12 34.1	+21 37	5.8†	G8	.08	0.5	.009
C	1604.....	110313	12 36.0	+69 21	8.2	G1	.46	4.3	.017
BD	+84°284....	.....	12 36.1	+84 11	10.0	K1	.20	6.1	.017
BD	+75°479....	110312	12 36.1	+74 58	8.1	K4	.02	−0.2	.002
	3303(B)..	110317	12 36.1	−12 28	6.4†	F1	.12	1.9	.013
	3304(A)..	110318	12 36.1	−12 28	6.3†	F6	.13	2.1	.014
	3307A....	110379	12 36.6	− 0 54	3.6	Fo	.56	2.8	.069
	3307B....	110380	12 36.6	− 0 54	3.7	Fo	.56	2.9	.069
	3308.....	110418	12 36.8	− 6 57	7.2	M1	.05	−0.4	.003
BD	+84°286....	110533	12 37.8	+84 12	7.7†	F9	.23	3.4	.014
	3316.....	110619	12 38.4	−37 9	7.5	G5	.71	4.9	.030
	3317.....	110646	12 38.5	− 1 2	6.1	G4	.10	2.8	.022
	3318.....	110666	12 38.7	−27 47	5.7	K4	.07	0.3	.008
	3321.....	110897	12 40.3	+39 49	6.0	F9	.38	4.3	.046
	3326.....	111028	12 41.3	+10 6	5.9	K1	.53	2.4	.020
	3327.....	111067	12 41.7	+17 7	5.3	K4	.01	0.3	.010
	3330.....	111199	12 42.4	− 5 45	6.3	F5	.05	2.9	.021
	3331.....	111239	12 42.8	+ 4 7	6.7	M4	.01	0.2	.005
	3336.....	111335	12 43.5	+67 20	5.7	K5	.01	0.3	.008
C	1627.....	111395	12 43.9	+25 23	6.4	G6	.37	4.9	.050
C	1628.....	111456	12 44.3	+60 52	5.9	F6	.10	3.1	.027
C	1630.....	111515	12 44.6	+ 1 45	8.1	G6	.66	4.9	.023
C	1633.....	111631	12 45.6	− 0 13	8.7	Mo	.39	8.4	.087
	3344A....	111720	12 46.2	− 9 48	6.5	G8	.02	0.9	.008
	3346.....	111765	12 46.5	+ 3 36	6.1	K4	.04	0.3	.007
	3347.....	111812	12 46.8	+28 5	5.1	F5	.03	2.3	.027
ADS	8690A....	111844	12 47.0	+19 43	7.7†	Fo‡	.07	1.3	.005
	3348(A)..	111862	12 47.2	+17 37	6.5	Mo	.02	−0.3	.004
	3350(B)..	111892	12 47.4	+17 39	6.9	F5	.05	2.7	.014
C	1640.....	111980	12 47.9	−17 57	8.3	F6	.88	3.0	.009
	3353.....	111998	12 48.1	− 3 1	6.2	F6	0.26	3.2	0.025

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
3355A....	112033	$12^h48^m.4$	+21°47′	5.2†	G6	0″.06	0.7	0″.013
3360.....	112097	12 48.8	+12 58	6.6†	A8s	.07	2.6	.016
3362.....	112142	12 49.2	− 9 0	4.9	M3	.03	−0.5	.008
3367A....	112300	12 50.6	+ 3 56	3.7	M3	.48	−0.1	.017
3368.....	112374	12 51.1	−25 55	6.8	cF6	.03	−1.0	.003
3372.....	112429	12 51.5	+65 59	5.3	A5n	.04	2.0	.022
BD −13°3627.....	112575	12 52.5	−13 55	8.9	K6	.54	7.1	.044
BD +44°2238.....	112610	12 52.9	+44 21	8.0	F4	.07	3.3	.011
C 1657.....	112758	12 53.9	− 9 18	7.7	K1	.85	5.8	.042
3374.....	112769	12 54.0	+17 57	5.0	Mo	.04	0.2	.011
C 1660.....	112956	12 55.2	+69 19	8.2	G7	.40	4.9	.022
C 1661.....	112943	12 55.2	− 2 10	9.5	Mo	.73	8.0	.050
3378A....	112992	12 55.4	− 2 50	6.1	K2	.05	0.7	.008
3379A....	112989	12 55.5	+31 19	5.1	G9	.04	0.1	.010
ADS 8735A....	113022	12 55.7	+18 55	6.1	F4	.24	3.4	.029
3380.....	113092	12 56.1	+67 8	5.5	G9	.15	0.3	.009
C 1666.....	113083	12 56.1	−26 50	8.2	F4	.54	4.0	.014
3381.....	113095	12 56.2	+17 40	6.0	G7	.03	0.5	.008
C 1667.....	113101	12 56.2	− 7 54	8.7	Ko	.50	5.5	.023
ADS 8740A....	113097	12 56.3	+16 25	9.5	F6	.....	3.2	.005
3382A....	113139	12 56.4	+56 54	4.9	A6n	.10	1.8	.024
3383.....	113226	12 57.2	+11 30	3.0	G6	.27	0.4	.030
3385.....	113337	12 57.9	+64 9	6.0	F4	.18	3.3	.029
3387A....	113415	12 58.4	−20 3	6.1†	F8	.14	3.8	.035
3388AB..	113459	12 58.8	− 3 8	7.2†	A7n	.06	2.0	.009
3394.....	113817	13 1.2	−14 23	7.2	G8	.03	2.4	.011
3396A....	113847	13 1.4	+45 48	5.7	K2	.05	0.4	.009
ADS 8777A....	113865	12 1.4	+29 34	6.4	A3n	.00	1.9	.013
3397.....	113848	13 1.5	+21 41	6.0	F1	.09	3.1	.026
3398.....	113866	13 1.5	+23 9	5.9	M5	.07	−0.4	.005
3401.....	113996	13 2.4	+28 10	4.9	K5	.09	0.2	.011
3402.....	113994	13 2.4	+62 35	6.3	G7	.04	0.6	.007
3403.....	114038	13 2.7	−10 12	5.3	K3	.02	0.3	.010
βGC 6393A....	114060	13 3.0	+24 33	8.6	G5	.27	5.1	.020
βGC 6393B....	.....	13 3.0	+24 33	9.0	G8	.27	5.6	.021
BD + 4°2696.....	114094	13 3.2	+ 4 19	9.5	G6	.54	5.2	.014
3404.....	114113	13 3.3	− 8 27	5.7	K3	.08	0.7	.010
3405.....	114149	13 3.7	−22 35	5.1	K1	.06	0.4	.011
C 1687.....	114174	13 3.8	+ 5 46	6.9	G6	.68	4.2	.029
3406.....	114256	13 4.2	+10 33	6.0	Ko	.02	0.7	.009
3408.....	114287	13 4.5	− 9 48	6.2	K5	.02	0.3	.007
BD +18°2696.....	114300	13 4.6	+18 0	8.7	Mo	.12	−0.1	.002
3412AB..	114378–9	13 5.1	+18 3	6.0†	F4	.45	3.6	.033
ADS 8810A....	114493	13 5.8	+13 50	7.3	K2	.04	0.7	.005
C 1692.....	114606	13 6.4	+10 9	8.5	F9	0.56	3.5	0.010

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	3421.....	114613	13h 6m.5	−37°16′	4.9	G3	0″.39	4.6	0″.087
	3422A....	114642	13 6.7	−15 40	5.1	F5	.31	3.0	.038
	3423.....	114674	13 6.9	+41 19	7.3	G6	.03	0.6	.005
C	1693.....	114703	13 7.0	+68 2	8.8	K1	.73	5.7	.024
CD	−34°8720.....	114692	13 7.0	−34 12	7.6	F7	0.51	3.1	.013
	3424.....	114710	13 7.2	+28 23	4.3	G0	1.18	4.5	.110
	3425.....	114729	13 7.2	−31 20	6.7	G0	0.38	4.1	.030
ADS	8814A....	114723	13 7.3	+32.37	7.5†	F4	.04	3.2	.014
C	1695.....	114762	13 7.5	+18 3	7.7	F7	.58	3.5	.014
C	1702.....	.....	13 8.8	+74 23	9.8	G2	.33	4.7	.010
	3430.....	114946	13 8.8	−19 24	5.6	G6	.20	4.7	.066
	3434A....	115046	13 9.5	+11 52	5.8	M0	.09	0.1	.007
	3435(A)..	115080	13 9.7	−10 50	6.9	G3	.38	4.7	.036
	3436(B)..	115079	13 9.8	−10 49	7.8	K2	.01	0.6	.004
	3438.....	115202	13 10.6	−19 25	5.3	K1	.32	2.1	.023
	3442.....	115337	13 11.6	+81 0	6.3	G5	.01	0.8	.008
	3443.....	115383	13 11.8	+ 9 57	5.2	F8	.38	3.7	.050
ADS	8841A....	115404	13 11.9	+17 33	6.7†	K3	.67	6.2	.079
	3444.....	115466	13 12.2	−10 1	7.2	A8s	.09	2.3	.010
BD	−14°3683.....	115467	13 12.2	−15 1	6.7	G7	.....	0.7	.006
	3445.....	115478	13 12.3	+14 12	5.4	K5	.03	0.4	.010
	3446.....	115521	13 12.6	+ 6 0	5.0	M2	.02	−0.4	.008
BD	+14°2593.....	115539	13 12.7	+14 18	7.3	G4	.10	1.2	.006
BD	−17°3811.....	115559	13 12.8	−17 47	9.2	G1	.19	3.7	.008
	3447.....	115604	13 13.1	+41 6	4.7	F5	0.12	2.0	.029
	3448A....	115617	13 13.2	−17 45	4.8	G6	1.52	5.2	.120
	3449.....	115659	13 13.5	−22 39	3.3	G6	0.08	0.6	.029
ADS	8861A....	.....	13 14.9	+35 40	9.6	M1	.88	9.2	.083
	3454.....	115903	13 15.1	−10 47	7.1†	K0	.13	0.5	.005
C	1722.....	116012	13 15.7	+ 4 39	8.8	K5	.58	6.4	.033
	3455.....	116010	13 15.8	+40 41	5.7	K1	.06	0.5	.009
C	1723.....	116056	13 16.1	+43 38	8.2	K2	.44	5.5	.029
	3460.....	116175	13 16.8	−12 3	7.1	M1	.03	−0.4	.003
	3466.....	116303	13 17.7	+44 26	6.4	A8s	.08	1.1	.009
	3467.....	116365	13 18.1	− 4 24	5.9	K3	.03	0.4	.008
	3470.....	116459	13 18.6	+85 17	7.4	F7	.13	3.4	.016
ADS	8887A....	116405	13 18.9	+29 45	9.5†	M0	.54	8.3	.057
ADS	8887B....	.....	13 18.9	+29 45	9.8	K6	.54	7.5	.035
	3471.....	116568	13 19.3	− 4 38	6.1†	F3	.16	3.5	.030
	3474A....	116656	13 19.9	+55 27	2.9†	A2s‖	.13	0.8	.038
	3475B....	116657	13 19.9	+55 27	4.3†	A6s	.13	1.5	.027
	3477.....	116713	13 20.3	−39 14	5.2	K1p*	.20	1.6	.019
	3481.....	116870	13 21.4	−12 11	5.6	K5	.14	0.2	.008
C	1738.....	116926	13 21.8	+68 42	9.7	G3	.26	4.3	.008
	3482.....	116976	13 22.1	−15 27	4.9	K3	0.13	0.7	0.014

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
3483.....	117043	13h22m6	+63°46′	6.6	G6	0″.44	5.1	0″.050
3484.....	117104	13 22.9	−24 42	7.3	F7	.07	2.1	.009
3485.....	117126	13 23.2	− 0 19	7.8†	G1	.46	4.2	.019
3487.....	117176	13 23.5	+14 19	5.2	G5	.63	4.4	.069
3488.....	117187	13 23.6	+72 55	6.1	M1	.03	−0.5	.005
BD +34°2426.....	117262	13 24.1	+34 11	8.2	K2	.03	0.5	.003
3489.....	117246	13 24.1	−18 13	7.0	K2	.24	0.1	.004
3490.....	117267	13 24.1	− 0 51	6.4	K0	.08	0.7	.007
ADS 8917A....	.....	13 24.2	+12 0	8.6†	G8	.....	5.2	.021
3492.....	117304	13 24.3	+11 20	5.8	G9	.07	0.7	.010
BD +71° 651.....	117317	13 24.4	+70 51	7.5	A9s	.04	2.1	.008
BD − 7°3631.....	117421	13 25.1	− 8 4	9.6	F5	.....	3.3	.005
BD +70° 741.....	117448	13 25.3	+70 39	7.5	G8	.04	1.0	.005
3497.....	117566	13 26.1	+79 10	5.9	G4	.14	0.5	.008
C 1748.....	117635	13 26.6	− 1 49	7.3	G7	.88	5.1	.036
BD +88° 77.....	117672	13 26.8	+88 4	8.4	F2	.02	2.4	.006
3499.....	117675	13 26.8	− 5 44	4.8	M3	.11	0.1	.011
3500.....	117710	13 26.9	+42 37	6.2	K2	.09	0.6	.008
+ 9°2773.....	117697	13 26.9	+ 9 30	7.9	F9	.02	3.3	.012
3503A....	117789	13 27.5	−14 51	5.6	K2	.07	0.5	.010
3504.....	117818	13 27.7	− 9 39	5.4	G5	.05	1.1	.014
3505.....	117878	13 28.2	− 7 7	7.1	A4n	.08	2.1	.010
ADS 8939A....	117902	13 28.3	+35 25	7.3†	A3n	.05	2.1	.009
20C 787.....	117939	13 28.6	−38 23	7.1	G3	.62	4.8	.035
ADS 8949A....	118036	13 29.2	+ 0 12	7.7†	K1	.23	6.0	.046
3507A....	118054	13 29.4	−12 42	6.3†	A1n	.07	1.7	.012
3510.....	118219	13 30.3	− 4 53	5.8	G6	.07	1.0	.011
3511.....	118216	13 30.3	+37 42	5.3†	F2	.08	2.7	.030
C 1761.....	118330	13 31.1	− 0 25	7.0	F6	.23	3.4	.019
ADS 8959A....	118328	13 31.2	+68 17	8.9†	G2	.17	4.3	.012
ADS 8959B....	.....	13 31.2	+68 17	9.4	G4	.17	4.6	.011
3518A....	118623	13 33.0	+36 48	5.3†	A3n	.10	2.2	.024
3522A....	118742	13 33.7	+39 41	7.9†	G2	.28	4.1	.017
3523A....	118741	13 33.7	+51 13	6.8†	M3	.02	−1.4	.002
3526AB..	118889	13 34.6	+11 15	6.3†	A0n	.11	1.5	.011
3527.....	118904	13 34.8	+71 45	5.7	K2	.04	0.4	.009
BD +76° 493.....	118936	13 35.1	+76 26	8.0	G3	.29	4.2	.017
BD +48°2141.....	118954	13 35.1	+48 24	7.9	F0	.03	2.6	.009
3531A....	119055	13 35.9	+20 28	5.7	A3s	.05	1.2	.013
3531B....	.....	13 35.9	+20 28	8.6	A7s	.05	1.4	.004
BD +33°2361.....	119054	13 36.0	+33 21	7.8	F5	.06	3.8	.016
3533.....	119126	13 36.3	+23 0	5.8	G9	.04	0.8	.010
ADS 8992A....	119124	13 36.4	+51 1	6.3	F9	.16	3.9	.033
3534.....	119149	13 36.4	− 8 12	5.2	M2	.11	0.0	.009
20C 795.....	119217	13 36.8	+ 0 23	9.6	M1	0.42	8.6	0.063

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	3536.....	119228	13^h36^m9	+55°11′	4.8	M2	0″.03	0.0	0″.011
C	1777.....	119288	13 37.3	+ 8 54	6.1	F3	.39	3.0	.024
	3537A....	119425	13 38.0	+ 4 3	5.7†	K3	.30	0.7	.010
	3538A....	119461	13 38.3	− 3 46	7.0	K4	.04	0.4	.005
	3541.....	119584	13 39.0	+23 12	6.4	K4	.07	0.6	.007
	3542.....	119605	13 39.1	−15 41	5.7	F9	.01	2.0	.018
	3543.....	119706	13 39.7	− 7 8	7.1	K0	.04	0.4	.005
	3544.....	119756	13 40.0	−32 32	4.4	F0	0.49	2.5	.042
C	1784.....	.....	13 40.2	+18 20	9.7	M1	1.86	9.2	.079
	3548A....	119853	13 40.6	−11 56	5.8	G7	0.02	0.7	.010
C	1786.....	119850	13 40.7	+15 26	8.5	M2	2.29	10.0	.200
C	1789.....	119992	13 41.5	+56 23	6.4	F4	0.37	3.4	.025
	3551.....	120033	13 41.9	− 9 13	6.2	K5	.04	0.4	.007
	3553.....	120052	13 42.0	−17 22	5.8	M2	.06	−0.7	.005
	3554.....	120066	13 42.0	+ 6 51	6.3	G2	.50	3.8	.032
	3555.....	120064	13 42.1	+26 12	6.6†	F3‖	.07	3.3	.022
	3557.....	120084	13 42.2	+78 34	6.1	G7	.08	0.7	.008
	3558A....	120136	13 42.5	+17 57	4.5	F6	.49	3.5	.063
20C	808.....	.....	13 42.5	+ 6 49	9.7	M0	.54	8.3	.052
	3559.....	120164	13 42.7	+39 3	5.6	G9	.12	0.6	.010
	3561.....	120198	13 42.9	+54 56	5.5	A2sp*	.02	0.9	.012
C	1796.....	120237	13 43.1	−35 12	6.5	F8	.57	4.0	.032
	3568.....	120348	13 43.9	+42 33	6.8	K2	.08	0.5	.005
	3570.....	120420	13 44.1	+31 41	5.8	G7	.04	1.1	.011
	3571.....	120452	13 44.4	−17 38	5.1	K2	.11	0.6	.013
ADS	9031A....	120476	13 44.5	+27 29	7.9†	K6	.46	7.0	.066
ADS	9031B....	.....	13 44.5	+27 29	8.3	K6	0.46	7.4	.066
20C	813.....	120467	13 44.5	−21 36	7.9	K6	1.82	7.6	.087
	3572.....	120477	13 44.7	+16 18	4.3	M0	0.11	0.5	.017
	3573.....	120539	13 45.0	+21 46	5.1	K5	.02	0.3	.011
	3574.....	120565	13 45.2	+83 15	6.2	G6	.06	0.9	.009
C	1804.....	120690	13 45.8	−23 53	6.5	G5	.66	4.8	.046
	3581.....	120819	13 46.7	+35 10	6.0	M1	.07	−0.2	.006
BD	−17°3949....	120901	13 47.2	−18 13	7.0	F3	.....	4.2	.027
	3584.....	120933	13 47.4	+34 56	5.0	M2	.04	−0.5	.008
	3588.....	121107	13 48.4	+18 26	5.7	G4	.04	0.5	.009
	3589A....	121130	13 48.5	+65 13	4.8	M3	.00	−0.6	.008
	3594.....	121299	13 49.6	− 1 1	5.3	K2	.09	0.4	.010
	3595A....	121325	13 49.7	− 7 34	6.5†	F7	.16	3.5	.025
	3595B....	.....	13 49.7	− 7 34	7.7	G1	.17	4.3	.021
	3596A....	121370	13 49.9	+18 54	3.1†	F7	.37	3.2	.105
	3598.....	121457	13 50.3	+79 29	6.6	K1	.05	0.9	.007
	3601.....	121710	13 52.0	+27 59	5.2	K5	.06	−0.2	.008
BD	+44°2312....	121825	13 52.8	+44 46	7.6	F9	.01	3.9	.018
C	1826.....	121849	13 52.9	−33 30	8.4	G3	0.58	4.5	0.017

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
ADS 9072A....	121906	13h53m4	+19°57′	8.6	F2	0″.06	3.0	0″.008
C 1828.....	121953	13 53.7	+65 51	7.6	G2	.29	4.0	.019
3605.....	121980	13 53.8	+15 8	6.0	K5	.09	0.6	.008
3607.....	122066	13 54.4	−24 31	5.8	F3	.24	2.6	.023
3608.....	122106	13 54.6	− 3 4	6.3	F5	.07	2.9	.021
20C 825.....	.....	13 54.8	+34 21	10.2	A4sp*	.54	5.0	.009
3614.....	122430	13 56.7	−26 57	5.7	K3	.04	0.3	.008
BD +29°2483.....	122442	13 56.8	+28 53	7.9	A7s	.01	1.9	.006
βGC 6703A....	122510	13 57.2	−31 12	6.6†	F5	.11	2.6	.016
ADS 9090B....	.....	13 58.5	+46 49	9.9	M4	.55	10.0	.105
ADS 9094AB..	122769	13 58.8	+ 8 58	8.5†	F5	.....	3.0	.008
3616.....	122837	13 59.0	−14 29	6.4	G6	.05	0.8	.008
BD +29°2486.....	122992	14 0.0	+29 37	8.2	M4	.06	−0.2	.002
3622.....	123123	14 0.7	−26 12	3.5	K3	.17	0.4	.024
3623.....	123139	14 0.8	−35 53	2.3	G9	.75	0.6	.046
3625.....	123255	14 1.4	− 8 50	5.5	A8n	.14	2.2	.022
BD +29°2493.....	123409	14 2.4	+28 54	7.0	G6	.05	2.5	.013
ADS 9115A....	123453	14 2.7	−12 27	7.7†	F7	.14	3.5	.014
3629.....	123630	14 3.7	− 9 52	6.5	G7	.02	0.9	.008
3630.....	123657	14 3.9	+44 20	5.4	M4	.04	−1.0	.005
C 1858.....	123760	14 4.5	+10 43	8.2†	G1	.17	4.7	.020
3631A....	123782	14 4.6	+49 56	5.4	M2	.07	−0.3	.007
3632.....	123934	14 5.4	−15 50	5.1	M3	.03	−1.7	.004
3634.....	123977	14 5.7	+59 49	6.5	G8	.12	0.6	.007
3635.....	123999	14 5.8	+25 34	5.3†	F5	.08	2.9	.033
3638.....	124206	14 7.0	−26 47	5.2	K3	.06	0.2	.010
3640.....	124248	14 7.2	− 9 26	7.3	A8s	.05	1.8	.008
3641.....	124281	14 7.5	−26 9	6.3	G7	.00	0.3	.006
3642.....	124294	14 7.6	− 9 49	4.3	K2	.13	0.6	.018
3644.....	124425	14 8.5	− 0 22	6.1†	F4	.24	2.8	.022
3647.....	124553	14 9.1	− 5 29	6.3	F8	.32	3.6	.029
3649.....	124547	14 9.2	+78 1	5.3†	K4	.04	0.3	.010
3650.....	124570	14 9.3	+13 26	5.5	F6	.27	3.4	.038
ADS 9167A....	124640	14 9.7	+55 48	8.8†	K5	.34	6.7	.038
ADS 9167B....	.....	14 9.7	+55 48	9.1	K5	.34	6.8	.035
3652B....	124674	14 9.9	+52 15	6.9†	F1	.06	3.2	.018
3654A....	124675	14 9.9	+52 15	4.9†	A7n	.07	1.6	.022
3655.....	124679	14 10.0	+10 34	5.4	G6	.17	1.0	.013
3656.....	124730	14 10.2	+69 54	5.4	M2	.07	0.3	.010
ADS 9182A....	124757	14 10.3	+ 3 36	7.8†	F7	.19	4.1	.018
ADS 9182B....	.....	14 10.3	+ 3 36	7.9	F8	.19	4.3	.019
3658.....	124755	14 10.4	+41 59	6.2	K3	.12	0.9	.009
3660.....	124850	14 10.8	− 5 31	4.2	F5	0.43	3.0	.057
3662.....	124897	14 11.1	+19 42	0.2	K0	2.28	0.2	.100
ADS 9192A....	125040	14 11.9	+20 35	6.6†	F4	0.18	3.4	0.023

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
ADS 9191A....	125140.	14^h12^m5	+57° 8′	9.7†	G3	0″.03	3.9	0″.007
ADS 9191B....	.....	14 12.5	+57 8	11.0	F1	.02	2.8	.002
BD +15°2690.....	125180	14 12.7	+15 44	6.0	M3	.01	−0.3	.005
3671A....	125276	14 13.3	−25 22	5.9	F4	.54	3.7	.036
3673.....	125351	14 13.8	+35 58	5.1†	K1	.02	0.4	.011
3678.....	125454	14 14.4	− 1 48	5.2	G9	.14	0.9	.014
C 1882.....	125455	14 14.4	− 4 41	7.6	K1	.67	5.5	.038
3679.....	125451	14 14.4	+13 28	5.3	F1	.11	3.0	.035
BD +15°2695.....	125504	14 14.7	+15 23	8.1	K5	.01	0.2	.003
3681.....	125560	14 15.0	+16 46	5.0	K3	.16	0.7	.014
3689.....	125932	14 17.3	−27 18	4.9	K3	.23	0.6	.014
ADS 9237B....	125906	14 17.4	− 7 19	7.5†	F6	.12	3.7	.017
C 1885.....	.....	14 17.6	+30 6	8.6	Mo	.73	8.1	.079
3691.....	126035	14 18.0	−11 15	6.3	G7	.07	0.6	.007
C 1886.....	126053	14 18.1	+ 1 43	6.3	G3	.53	4.5	.044
3692BC..	126128	14 18.5	+ 8 54	7.6†	F2	.07	3.0	.012
3695.....	126218	14 19.1	−24 21	5.4	G8	.08	0.5	.010
3698A....	126251	14 19.3	−11 13	6.7†	Fo	.08	2.6	.015
ADS 9258A....	126367	14 19.9	−19 31	6.4	A8s	.06	2.7	.018
3701.....	126400	14 20.0	−26 24	6.6	G7	0.08	2.4	.014
βGC 6869A....	.....	14 21.1	+24 6	9.5	M1	1.39	9.0	.079
βGC 6869B....	.....	14 21.1	+24 6	9.6	M2	1.40	9.2	.083
3703.....	126597	14 21.4	+38 51	6.3	K2	0.02	0.2	.006
3704.....	126660	14 21.8	+52 19	4.1	F6	.47	3.3	.069
3708.....	126766	14 22.3	−12 55	6.7	F2	.09	3.2	.020
3710A....	126868	14 23.0	− 1 47	5.0	F8	.13	3.6	.052
20C 860.....	.....	14 23.3	+24 18	10.2	Mo	.50	7.3	.026
3711.....	126927	14 23.4	− 6 27	5.7	K5	.08	0.3	.008
3714A....	127168	14 24.8	− 3 48	7.0	F1	.11	3.2	.017
3715.....	127243	14 25.2	+50 18	5.6	G4	0.31	2.7	.026
C 1905.....	127339	14 25.6	− 8 12	9.3	M1	1.26	8.8	.079
ADS 9291A....	127356	14 25.8	−15 11	8.3†	G4	0.43	5.0	.022
20C 868.....	127506	14 26.7	+35 53	8.2	K5	.55	6.9	.055
3717A....	127665	14 27.5	+30 49	3.8	K3	.15	0.5	.022
3718A....	127700	14 27.7	+76 8	4.4	K4	.02	0.2	.014
3719AB..	127726	14 27.9	+27 7	6.5†	A3n	.09	2.0	.013
3721.....	127739	14 28.0	+22 42	6.0	F2	.13	2.6	.021
3722A....	127762	14 28.1	+38 45	3.0	A5n	.18	1.6	.052
C 1913.....	127871	14 28.7	+ 9 47	8.9	K6	.54	6.8	.038
ADS 9306A....	127930	14 29.0	+49 37	7.8	F3	.05	3.3	.013
3728.....	128165	14 30.2	+53 20	7.4	K5	.32	6.7	.072
3729.....	128167	14 30.3	+30 11	4.5	F2	.23	3.2	.055
C 1920.....	.....	14 30.9	+34 11	9.5	Mo	.76	8.4	.060
3733.....	128333	14 31.2	+49 48	5.9	M1	.07	−0.3	.006
3734.....	128429	14 31.7	−11 53	6.2	F5	0.95	3.1	0.024

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
3735A*	128620	14^h52^m8	−60°25′	0.3	G4	3″.67	4.8	0″.794
3735B*	128621	14 32.8	−60 25	1.7	K5	3.67	6.2	.794
3736	128750	14 33.6	+18 44	6.0	K2	0.10	0.5	.008
3737	128756	14 33.6	−24 36	8.1	Ko	.05	0.7	.003
3740	128902	14 34.5	+44 4	5.9	K2	.11	0.1	.007
3741AB	128941	14 34.7	+52 1	7.6†	F4	.05	2.9	.011
ADS 9331A	128967	14 34.9	+27 14	8.4	F2	.04	1.9	.005
BD + 0°3223	129230	14 36.3	+ 0 32	8.1	G7	.03	0.7	.003
3752A	129247	14 36.4	+14 9	4.4	A2n	.06	2.1	.035
3753	129312	14 36.7	+ 8 35	5.0	G5	.01	−0.3	.009
3754	129336	14 36.9	+12 5	5.6	G7	.20	0.6	.010
3757	129456	14 37.5	−34 45	4.1	K5	.21	0.3	.017
3758	129502	14 37.8	− 5 13	4.3†	F3	.34	2.7	.048
ADS 9352A	.....	14 38.0	+19 55	9.9†	Mo	.....	7.2	.029
ADS 9346A	129580	14 38.2	+58 23	7.1	Ko	.24	4.9	.036
ADS 9346B	.....	14 38.2	+58 23	8.1	G7	.24	4.5	.019
20C 879	.....	14 38.4	+ 6 15	10.2	G2	.92	4.7	.008
3761	129712	14 39.0	+26 57	4.9	M3	.02	−0.8	.007
3762A	129798	14 39.6	+61 41	6.3†	F4	.08	3.0	.022
3764	129846	14 39.9	+40 53	5.8	K4	.02	0.2	.008
3766A	129926	14 40.2	−25 1	5.0	F1	.21	2.0	.025
3766B	.....	14 40.2	−25 1	6.9	F9	.21	3.4	.020
3768	129978	14 40.4	−15 2	6.6	K2	.03	0.5	.006
3769	129980	14 40.5	−20 45	6.4	F9	.13	3.8	.030
3770	129972	14 40.6	+17 23	4.7	G6	.08	0.6	.015
3771A	129989	14 40.6	+27 30	2.8†	Ko	.05	−0.1	.026
3771B	129988	14 40.6	+27 30	5.1	A3n	.05	1.8	.022
BD +34°2559	130083	14 41.1	+34 47	8.1†	M2	.04	−0.7	.002
ADS 9380A	130145	14 41.4	+10 5	7.6†	G1	.27	4.5	.024
3773	130157	14 41.5	−20 54	6.1	K5	.02	0.0	.006
ADS 9378A	130188	14 41.7	+42 48	7.7†	F5	.13	3.2	.013
C 1948	.....	14 41.7	+16 57	9.3	K6	.95	7.9	.052
ADS 9387A	130412	14 43.0	−16 55	7.4†	G7	.....	4.7	.029
3778A	130529	14 43.5	−23 50	5.8	K1	.03	−0.3	.006
3779A	130559	14 43.8	−13 44	5.8†	A4sp*	.07	0.3	.008
3779B	.....	14 43.8	−13 44	6.7	A4sp*	.07	0.6	.006
BD +18°2935	130652	14 44.2	+18 37	7.4	Ko	.03	0.6	.004
3781	130694	14 44.4	−27 33	4.6	K4	.25	−0.1	.011
BD +44°2393	130741	14 44.8	+44 39	9.4	F5	.06	3.9	.008
3784A	130819	14 45.2	−15 35	5.3	F4	.13	3.1	.036
3785	130817	14 45.2	+38 13	6.0	F3	.28	3.1	.026
C 1960	130871	14 45.5	+ 7 14	9.4	K6	.60	6.8	.030
3789	130945	14 45.7	+46 32	5.8	F4	.09	3.1	.029
3790	130952	14 45.8	− 1 53	5.0	G6	.16	1.0	.016
3791	130989	14 46.0	−17 22	6.7	F4	0.13	3.2	0.020

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
BD −20°4107	130991	14h46m.0	−20°12′	7.5	G9	.....	0.5	0″.004
C 1962	130992	14 46.0	−23 53	7.7	K5	1″.02	6.9	.069
3792	131027	14 46.2	−17 57	6.8	G7	0.02	0.7	.006
3793A	131041	14 46.3	+49 8	6.1†	F6	.15	3.3	.027
3793B	.....	14 46.3	+49 8	7.1†	F1	.15	3.2	.017
3795	131111	14 46.5	+37 41	5.5	K0	.23	1.3	.014
3797	131117	14 46.6	−30 10	6.4	G1	.34	4.0	.033
3798A	131156	14 46.8	+19 31	4.8	G5	.17	5.3	.126
3798B	.....	14 46.8	+19 31	6.8	K5	.17	6.9	.105
ADS 9418AB	131315	14 47.8	+45 20	8.5†	G0	.09	4.0	.013
ADS 9419A	131316	14 47.8	+45 1	8.0	F5	.03	2.6	.008
ADS 9423A	131334	14 47.9	+19 9	8.2†	G0	.18	4.2	.016
3801	131430	14 48.5	−24 14	5.4	K2	.04	0.4	.010
BD +66° 873	131444	14 48.6	+66 3	7.2	M0	.01	−0.6	.003
ADS 9425A	131473	14 48.7	+16 7	6.9†	F9	.02	3.4	.020
3803	131507	14 48.9	+59 42	5.7	K4	.18	0.4	.009
C 1972	131511	14 48.9	+19 33	6.0	K1	.50	5.5	.079
3804	131530	14 49.0	−11 29	5.8	G7	.07	0.8	.010
C 1973	131582	14 49.3	+23 45	8.8	K6	.82	6.9	.042
3809	131873	14 51.0	+74 34	2.2	K5	.03	−0.5	.029
3810	131918	14 51.3	−11 0	5.6	K4	0.00	0.0	.008
3812(B)	131976	14 51.6	−20 58	8.0	M2	1.92	9.3	.182
3813(A)	131977	14 51.6	−20 58	5.8	K5	2.04	6.9	.166
ADS 9442A	132029	14 51.8	+32 42	6.1	A3n	.....	1.9	.014
3814	132052	14 52.0	− 3 56	4.6	A9n	0.19	1.8	.027
C 1980	132142	14 52.3	+54 4	7.9	K0	1.08	5.4	.032
3816A	132132	14 52.4	+ 0 14	5.7	K1	0.07	0.5	.009
3817	132146	14 52.5	+16 47	5.8	G5	.03	0.2	.008
3822	132254	14 53.1	+50 2	5.7	F7	.26	3.8	.042
3823A	132345	14 53.5	−10 45	6.0	K4	.13	0.2	.007
βGC 7075A	132347	14 53.5	−30 19	7.0	F0	.07	3.1	.017
ADS 9457A	132375	14 53.7	− 4 35	6.0	F6	.38	3.5	.032
C 1988	132475	14 54.2	−21 36	8.5	A0sp*	.78	4.7	.017
C 1989	132683	14 55.3	−10 43	9.3	M0	.47	8.8	.079
3827	132813	14 56.0	+66 20	4.9	M5	.08	−0.3	.009
3828	132833	14 56.1	− 2 22	5.7	M0	.05	−0.5	.006
3831A	132933	14 56.7	+ 0 15	6.0†	M2	.03	−1.0	.004
3833	133002	14 57.1	+82 55	5.7	G0	.29	3.8	.042
3834	133124	14 57.7	+25 24	4.9	K5	.06	0.5	.013
3835	133165	14 57.8	+ 2 29	4.6	K0	.05	0.7	.017
3836	133208	14 58.2	+40 47	3.6	G5	.06	0.3	.022
3837	133216	14 58.2	−24 53	3.4	M4	.09	−0.3	.018
3841	133392	14 59.1	+35 36	5.7	G8	.05	0.4	.009
BD +29°2618	133544	15 0.0	+29 26	7.8	A2n	.03	1.9	.007
3842	133582	15 0.2	+27 20	4.7	K2	0.18	0.4	0.014

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
3843.....	133621	15h 0m3	+72° 9′	6.7	G2	0″.40	4.1	0″.030
3847(A)..	133640	15 0.5	+48 3	5.3†	G1	.40	4.5	.069
3849.....	133774	15 1.0	−15 52	5.3	K5	.06	−0.1	.008
3851.....	133872	15 1.7	+84 20	7.1	K3	.02	0.2	.004
BD +29°2621.....	.....	15 1.8	+29 23	9.2	G6	.02	1.0	.002
BD +30°2611.....	.....	15 2.7	+30 24	8.5	Fo	.04	2.2	.005
3855.....	134083	15 2.9	+25 16	5.0	F4	.26	3.3	.046
C 2010.....	134088	15 2.9	− 7 31	8.1	F8	.48	4.0	.015
C 2011.....	134113	15 3.0	+ 9 16	8.7	F8	.53	3.4	.009
C 2012.....	.....	15 3.1	+25 18	10.2	Mo	.98	8.6	.048
3856.....	134190	15 3.4	+54 56	5.2	G4	.04	0.9	.014
20C 912.....	.....	15 3.6	+32 48	10.8	Go	.51	4.0	.004
ADS 9517A....	134285	15 3.9	+ 2 4	7.8	F1	.....	2.7	.010
3858.....	134329	15 4.0	−23 36	6.8	K5	.05	0.3	.005
3859.....	134320	15 4.1	+26 41	5.7	K2	.03	0.0	.007
3860A....	134335	15 4.2	+25 29	5.9	K1	0.02	0.8	.010
C 2018.....	134440	15 4.7	−15 59	9.9	Ko	3.69	5.7	.014
C 2019.....	134439	15 4.7	−15 54	9.4	G2	3.68	4.4	.010
3867.....	134943	15 7.5	+19 21	6.0	M4	0.00	−0.5	.005
3869.....	134987	15 7.6	−24 56	6.4	G4	.40	4.5	.042
3870.....	135100	15 8.2	+49 4	8.9†	F1‖	.03	2.9	.006
ADS 9535A....	135101	15 8.3	+19 39	6.8	G5	.66	4.8	.040
ADS 9535B....	.....	15 8.3	+19 39	7.6	G6	0.66	4.6	.025
ADS 9544AB..	135204	15 8.8	− 0 58	7.2†	G8	1.37	5.3	.042
20C 920.....	.....	15 8.8	− 3 26	9.6	Mo	0.78	8.2	.052
3873A....	135208	15 8.8	−18 3	6.7	F3	.12	3.2	.020
BD +59°1632.....	135244	15 9.0	+59 26	7.6	K5	.01	−0.1	.003
BD +76° 552.....	135363	15 9.6	+76 34	9.2	K1	.21	6.3	.026
3881.....	135402	15 9.8	+38 38	6.4	K2	.05	0.5	.007
3882.....	135482	15 10.2	+ 5 19	5.4	Ko	.02	0.3	.010
3884.....	135534	15 10.6	−22 2	5.7	K5	.04	0.4	.009
3887A....	135722	15 11.5	+33 41	3.5	G4	.16	0.8	.029
ADS 9564A....	135725	15 11.5	− 7 55	8.2†	G4	.25	4.6	.019
3891.....	135758	15 11.7	−29 47	4.4	Ko	.03	0.2	.014
BD +10°2818.....	135775	15 11.8	+10 4	6.6	F4	.....	1.9	.011
3893.....	136064	15 13.5	+67 44	5.2	F9	.46	3.1	.038
ADS 9573A....	136136	15 13.9	+44 10	8.6	G8	.03	4.4	.014
ADS 9573B....	.....	15 13.9	+44 10	8.6	G6	.03	4.8	.017
3894.....	136138	15 13.9	+20 56	5.7	G5	.04	0.5	.009
ADS 9580A....	136160	15 13.9	+10 48	6.7	F5	.08	3.6	.024
ADS 9580B....	.....	15 13.9	+10 48	8.1	Go	.08	4.2	.017
ADS 9578A....	136176	15 14.0	+27 12	7.1†	F8	.12	3.7	.021
3895A....	136202	15 14.2	+ 2 9	5.2	F6	0.64	3.3	.042
20C 923.....	.....	15 14.2	− 7 21	10.6	M5	1.32	11.0	.120
C 2043.....	136257	15 14.6	− 8 18	7.9	F8	0.21	3.4	0.013

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
C 2044	136274	15^h14^m7	+26° 4′	8.1	G4	0″.58	4.4	0″.018
3900	136366	15 15.2	−17 48	6.2	G8	.07	0.3	.007
BD −14°4182	136406	15 15.4	−15 1	7.5	G9	.....	0.5	.004
3902A	136407	15 15.4	−15 11	6.1	A6n	.03	1.7	.013
3904	136479	15 15.8	− 5 28	5.6	K1	.08	0.6	.010
3907A	136514	15 15.9	+ 1 5	5.5	K4	.12	1.1	.013
3908	136512	15 16.0	+29 59	5.6	G7	.14	0.8	.011
ADS 9592A	136526	15 16.1	+31 4	9.9	F3	.....	3.4	.005
ADS 9592B	.....	15 16.1	+31 4	10.1	F4	.....	3.4	.005
3912	136726	15 17.2	+72 11	5.1	K4	.02	0.3	.011
3913	136801	15 17.5	−14 47	6.7	M0	.00	0.0	.005
C 2055	136834	15 17.7	+ 1 47	8.7	K5	.51	6.2	.032
3917	136956	15 18.4	−12 1	5.8	G6	.06	0.5	.009
3918	137006	15 18.6	− 0 40	6.1	A5n	.08	2.0	.015
3919	137052	15 18.8	− 9 58	5.4†	F3	.18	2.9	.032
3922	137071	15 18.9	+39 56	5.8	K4	.03	−0.3	.006
3923A	137107	15 19.1	+30 39	5.9†	F9	.24	4.1	.044
3926(A)	137391	15 20.7	+37 44	4.5	A7n	.17	1.9	.030
3927(B)	137392	15 20.7	+37 42	7.2†	G0	.17	4.5	.029
3930	137443	15 21.0	+63 42	5.8	K4	.11	0.5	.009
3931	137471	15 21.2	+15 47	5.5	M1	.03	−0.1	.008
ADS 9634A	137557	15 21.6	+18 31	8.3†	F4	.02	3.4	.010
3932	137629	15 21.9	+47 25	7.2†	F9	.06	3.7	.020
3933	137704	15 22.4	+34 41	5.9	K5	.12	0.1	.007
3935	137744	15 22.6	−16 22	5.9	K4	.05	0.4	.008
3936	137759	15 22.7	+59 19	3.5	K3	.01	0.2	.022
βGC 7268A	137763	15 22.7	− 8 59	6.8	K1	.35	5.8	.063
βGC 7268B	137778	15 22.7	− 8 59	8.1	K5	.35	6.5	.048
C 2067	137826	15 23.1	+66 54	9.0	G4	.28	4.8	.014
3938	137853	15 23.3	+25 27	6.3	M1	.04	−0.1	.005
3940	137909	15 23.7	+29 27	4.0†	A7s	.19	1.1	.026
3941	137949	15 23.9	−17 6	7.2	F1p*	.07	1.0	.006
3942	138137	15 25.0	−16 16	5.9	G6	.02	0.7	.009
ADS 9672A	138367	15 26.6	+57 47	6.9	F5	.30	3.6	.022
3945	138481	15 27.3	+41 10	5.2	K5	.02	−0.2	.008
3948	138562	15 27.8	− 0 51	5.8	G9	.05	0.6	.009
3951	138688	15 28.6	−27 43	5.5†	K4	.05	0.3	.009
3952	138716	15 28.7	− 9 43	4.8	K1	.39	2.1	.029
3958	138852	15 29.5	+64 33	5.9	G5	.13	1.1	.011
3959A	138905	15 29.9	−14 27	4.0	G6	.06	1.1	.026
3960A	138918	15 30.0	+10 52	4.5†	A5n	.07	1.6	.026
3960B	138917	15 30.0	+10 52	5.2	F0	.07	2.3	.026
3961	139006	15 30.5	+27 3	2.3	A1n	.16	1.8	.079
3962A	139063	15 31.0	−27 48	3.8	K5	.01	0.2	.019
3963	139074	15 31.0	+17 59	6.1	G8	0.08	0.7	0.008

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
3966.....	139137	15h31m4	− 0°14′	6.8†	F5	0″.04	2.8	0″.016
3967.....	139153	15 31.6	+39 21	5.4	M2	.03	−0.3	.007
3968.....	139195	15 31.7	+10 21	5.7†	G7	.14	0.5	.009
BD +82° 456.....	139213	15 31.8	+82 14	8.7†	G2	.21	4.1	.012
3969.....	139216	15 31.8	+15 26	6.8	M6	.01	−0.9	.003
BD +28°2447.....	139224	15 31.9	+28 45	8.3	F1	.02	3.1	.009
3970.....	139225	15 31.9	+16 27	5.9	A0n	.06	1.9	.016
3971.....	139254	15 31.9	−22 49	5.8	K0	.09	0.9	.010
3972.....	139307	15 32.2	+50 2	7.5	K5	.02	0.0	.003
BD − 0°2990.....	139308	15 32.3	− 0 33	8.1	K1	.04	0.4	.003
ADS 9716C....	139323	15 32.4	+40 10	7.9	K5	.46	6.3	.048
ADS 9716AB..	139341	15 32.5	+40 8	7.4†	K4	.46	6.3	.060
3974.....	139446	15 33.1	−18 58	5.5	G2	.13	2.3	.023
3975(B)..	139460	15 33.3	− 8 28	6.6	F6	.03	3.5	.024
3976(A)..	139461	15 33.3	− 8 28	6.5	F6	.03	3.8	.029
ADS 9727A....	139569	15 33.8	+30 26	8.8†	F6	.03	3.3	.008
ADS 9727B....	.....	15 33.8	+30 26	9.0	G1	.03	4.3	.011
C 2093.....	139590	15 33.9	+ 0 1	7.6	F9	.22	3.7	.017
3979.....	139641	15 34.2	+40 41	5.4	G5	.08	0.8	.012
3981.....	139663	15 34.4	−23 30	5.1	K4	.04	0.7	.013
3982.....	139669	15 34.4	+77 41	5.3	K4	.04	0.1	.009
3983(A)..	139777	15 35.0	+80 47	6.5	G3	.25	4.5	.040
3984.....	139780	15 35.0	+43 56	6.8	A1n	.00	2.1	.011
3985.....	139798	15 35.1	+47 8	5.8	F1	.16	3.2	.030
3986(B)..	139813	15 35.2	+80 47	7.6	K0	.25	5.4	.036
RW Coronae*.....	139815	15 35.2	+29 56	9.9†	F0	.....	2.9	.004
BD − 0°2997.....	139840	15 35.3	− 0 35	8.3	G8	.11	0.7	.003
3990.....	139997	15 36.2	−19 21	5.3†	M0	.13	0.4	.010
3992.....	140027	15 36.4	+16 21	6.0	G6	.03	0.2	.007
ADS 9747AB..	140122	15 36.9	+ 0 46	8.1†	A7s	0.03	1.8	.005
C 2101.....	140283	15 37.7	−10 36	7.3	A5sp*	1.18	4.9	.033
3996.....	140301	15 37.8	−14 43	6.4	K0	0.11	2.0	.013
4000A....	140538	15 39.0	+ 2 50	5.8	G5	.17	4.4	.052
4001A....	140573	15 39.3	+ 6 44	2.8	K2	.14	0.5	.035
4002.....	140687	15 39.9	−24 24	7.5	K1	.10	2.3	.009
4003.....	140716	15 40.0	+32 50	5.6	G9	.04	0.7	.010
C 2109.....	140901	15 41.0	−37 36	6.1	G6	.50	4.8	.055
4010.....	141004	15 41.6	+ 7 40	4.4	G0	.24	4.1	.087
C 2112.....	141039	15 41.7	+53 18	7.3	G2	.26	4.0	.022
4015.....	141477	15 44.2	+18 27	4.3	M1	.11	−0.2	.013
4020A....	141652	15 45.1	+80 18	7.3†	F0p‡	.05	2.5	.011
4023.....	141680	15 45.2	+ 2 30	5.3	G6	.06	0.4	.010
4024.....	141714	15 45.4	+26 22	4.7	G4	.11	1.6	.024
4026.....	141795	15 45.8	+ 4 47	3.8	A6s	.14	1.8	.040
4029.....	141853	15 46.1	−13 50	6.2	G5	0.04	0.3	0.007

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	4031.....	141992	$15^h46^m.9$	+21°17′	4.9	K5	0″.05	−0.1	0″.010
	4032.....	142091	15 47.5	+35 58	4.8	K1	.36	1.9	.026
	4039.....	142198	15 48.1	−16 26	4.3	G8	.16	0.6	.018
	4040.....	142267	15 48.5	+13 31	6.2	F9	.59	3.7	.032
	4042.....	142373	15 49.2	+42 44	4.6	F7	.76	3.6	.063
C	2124.....	142474	15 49.7	+74 43	9.3	K6	.32	7.9	.052
	4047.....	142531	15 49.9	+56 7	5.9	G8	.06	0.7	.009
	4048.....	142574	15 50.2	+20 36	5.8	Mo	.08	−0.5	.005
	4051.....	142640	15 50.6	−14 6	6.7†	F4	.11	3.2	.020
	4053A....	142661	15 50.7	− 1 52	6.7	F7	.11	3.9	.027
	4054.....	142780	15 51.3	+43 26	5.5	M3	0.08	−0.3	.007
	4055.....	142860	15 51.8	+15 59	4.2†	F5	1.33	3.3	.066
	4060.....	142980	15 52.6	+14 42	5.7	K4	0.13	−0.1	.007
	4063A....	143107	15 53.4	+27 10	4.2	K2	.11	0.3	.017
	4065.....	143173	15 53.8	+83 15	7.3	A6n	.02	2.1	.009
C	2134.....	143291	15 54.5	+28 1	8.1	G7	.85	5.0	.024
	4067.....	143333	15 54.7	−16 14	5.8†	F7	.75	3.1	.029
BD	+29°2748.....	143393	15 55.0	+29 44	7.2	K3	.06	0.4	.004
	4069.....	143435	15 55.3	+36 56	5.7	K5	.03	−0.1	.007
	4074.....	143553	15 55.9	+ 4 42	5.9	Ko	.08	0.9	.010
BD	+30°2735.....	143586	15 56.2	+29 55	8.6	G9	.02	2.0	.005
	4075.....	143666	15 56.7	+18 6	5.3	G6	.15	0.7	.012
	4077A....	143761	15 57.2	+33 36	5.4	Go	.81	3.9	.050
	4078.....	143787	15 57.3	−25 35	5.1	K5	.08	0.2	.010
	4079.....	143803	15 57.4	+75 52	6.9	G5	.03	0.8	.006
	4082(AB).	144069–70	15 58.9	−11 6	5.7†	F4	.07	3.0	.029
	4083(C)..	.....	15 58.9	−11 6	7.2	G7	.08	5.1	.038
ADS	9910A....	144087	15 58.9	−11 10	6.9	G6	.11	4.3	.030
ADS	9910B....	144088	15 58.9	−11 10	7.6	K1	.11	5.9	.046
	4085.....	144204	15 59.5	+53 12	6.2	K5	.04	0.0	.006
	4088.....	144208	15 59.6	+36 54	5.9	F3	.03	3.4	.032
C	2149.....	144287	15 59.9	+25 31	7.1	G8	.86	5.3	.044
	4090.....	144284	16 0.0	+58 50	4.4†	F7	.46	3.0	.052
C	2152.....	144515	16 1.2	+10 57	8.8†	Ko	.49	5.7	.024
C	2154.....	144579	16 1.5	+39 26	6.8	G8	.57	5.4	.052
	4095.....	144608	16 1.5	−20 36	4.6	G2	.07	0.6	.016
	4096.....	144690	16 2.0	−26 4	5.6	M2	.12	−0.8	.005
C	2160.....	144872	16 2.9	+38 55	8.6	K5	.59	6.6	.040
2cC	968.....	.....	16 2.9	+54 55	10.5	Mo	.64	8.3	.036
	4099.....	144937	16 3.3	+10 21	6.7	A6n	.05	2.3	.013
	4101(A)..	145001	16 3.6	+17 19	5.3	G4	.04	0.5	.011
	4102(B)..	145000	16 3.6	+17 19	6.5	K2	.05	0.7	.007
	4103.....	145002	16 3.6	+ 8 48	5.9	M3	.02	−0.3	.006
C	2163.....	145148	16 4.3	+ 6 40	6.0	K2	.76	5.6	.083
	4106.....	145206	16 4.6	− 3 12	5.7†	K5	0.02	0.2	0.008

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
4107.....	145250	16h 4m8	−29° 9′	5.2	K3	0″.14	0.3	0″.010
4108A....	145328	16 5.3	+36 45	4.9	K1	.32	1.3	.019
4124.....	145675	16 7.2	+44 5	6.5	K1	.34	5.2	.055
4125.....	145713	16 7.4	+23 45	6.0	M4	.03	−0.5	.005
ADS 9959A....	145730	16 7.4	+12 10	8.3	A8s	.....	2.9	.008
βGC 7542B....	145743	16 7.5	+14 48	8.7	G9	.....	0.5	.002
βGC 7542A....	145772	16 7.6	+14 49	8.1	K4	.02	0.3	.003
4127.....	145809	16 7.8	−21 9	6.7	Gc	.13	4.1	.030
4129.....	145849	16 8.1	+36 41	6.0†	K4	.04	0.3	.007
4130.....	145892	16 8.3	+ 5 17	5.6	K5	.05	0.3	.009
4131.....	145897	16 8.3	−11 35	5.5	K3	.02	0.1	.008
4132A....	145958	16 8.6	+13 48	7.5†	Kc	.46	5.6	.042
4132B....	.....	16 8.6	+13 48	7.6	K1	.46	5.6	.040
C 2172.....	145991	16 8.9	+66 6	9.6†	G6	.28	4.8	.011
BD +32°2691.....	146025	16 9.0	+32 51	7.9	Ko	.03	0.5	.003
4134.....	146051	16 9.1	− 3 26	3.0	Mo	.16	−0.1	.024
4136.....	146169	16 9.9	+ 8 7	6.8	K4	.03	0.6	.006
4137.....	146233	16 10.2	− 8 6	5.6	G1	.56	4.1	.050
4138A....	146361	16 10.9	+34 7	6.8†	F6‖	.30	3.7	.024
4138B....	146362	16 10.9	+34 7	6.7	G1	.30	4.0	.029
4139.....	146388	16 11.0	+19 4	5.9	K3	.10	0.6	.009
ADS 9982A....	146413	16 11.1	+ 7 37	9.4†	K6	.....	7.2	.036
4140.....	146436	16 11.1	−19 51	6.6	G8	.03	0.5	.006
4141.....	146452	16 11.3	+11 40	7.5	G7	.06	0.7	.004
BD +32°2697.....	146470	16 11.4	+32 25	8.5	K3	.04	0.5	.003
BD −14°4389.....	146543	16 11.7	−15 5	7.4	A5n	.....	1.8	.008
4142.....	146604	16 12.0	+23 22	6.6	G7	.03	1.1	.008
BD +19°3077.....	146698	16 12.5	+19 6	7.6	Mo	.02	0.0	.003
4146A....	146738	16 12.7	+29 24	5.7	A3n	.03	2.0	.018
4147.....	146791	16 13.0	− 4 27	3.3	G7	.09	0.7	.030
BD +38°2747.....	146828	16 13.2	+38 53	8.0	K5	.03	−0.3	.002
BD −14°4398.....	146850	16 13.3	−14 38	6.1	K4	.05	0.2	.007
4150.....	146834	16 13.3	−19 58	6.4	G7	.03	0.9	.008
BD +75° 585.....	.....	16 13.7	+74 54	8.8	M5	.04	0.1	.002
4152.....	146969	16 14.0	+66 37	8.2	K4	.01	−0.4	.002
4154.....	147025	16 14.2	+26 8	6.6	G6	.01	1.0	.008
4155.....	147084	16 14.6	−23 56	4.8	A5s	.04	0.6	.014
4157.....	147142	16 15.0	+75 28	6.5	K3	.04	0.4	.006
4159.....	147232	16 15.6	+60 0	5.6	M4	.02	−0.8	.005
C 2184.....	147379	16 16.5	+67 29	8.9	Mo	.50	8.7	.091
4161.....	147365	16 16.5	+39 57	5.5	A0n	.11	3.0	.032
4163.....	147449	16 17.0	+ 1 16	4.8	A7n	.17	1.9	.026
4165A....	147547	16 17.5	+19 23	4.1†	A6n	.06	1.5	.030
4169.....	147677	16 18.2	+31 7	4.7	Ko	.13	0.4	.014
4170.....	147700	16 18.3	−19 48	4.6	G9	0.07	0.6	0.016

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
4173(B)..	147749	16h18m6	+34° 2′	5.4	M2	0″.05	−0.1	0″.008
4175(A)..	147767	16 18.7	+33 56	5.3	K5	.06	0.1	.009
BD +32°2717.....	147851	16 19.2	+32 52	7.9	K4	.01	0.5	.003
4181.....	148048	16 20.4	+75 59	5.3†	A8n	.26	1.7	.019
BD +32°2721.....	148096	16 20.7	+32 42	8.1	K3	.04	0.4	.003
4182A....	148112	16 20.8	+14 16	4.5	A2s	.08	0.9	.019
ADS 10057A....	148147	16 21.0	+17 32	7.9	F8	.02	3.3	.012
C 2193.....	148211	16 21.3	−21 54	7.6	F8	.42	3.5	.015
4186.....	148293	16 22.0	+69 20	5.4	K1	.03	0.8	.012
4188.....	148349	16 22.3	− 7 22	5.4	M2	.18	−0.4	.007
4191A....	148374	16 22.5	+61 55	5.9†	G7	.05	0.4	.008
4192A....	148387	16 22.6	+61 44	2.9	G6	.06	0.7	.036
4192B....	.....	16 22.6	+61 44	8.8	K1	.06	5.3	.020
BD +51°2097.....	148433	16 23.0	+51 22	7.3	A8s	.11	2.4	.010
4193A....	148478	16 23.3	−26 13	1.5†	M1‡	.04	−3.8	.009
ADS 10069A....	148492	16 23.4	+21 7	8.3	F9	.11	3.8	.013
4195.....	148513	16 23.5	+ 0 53	5.5	K5	.08	0.1	.008
C 2196.....	148530	16 23.6	+ 3 29	9.0	K0	.53	5.5	.020
4197.....	148604	16 24.1	−14 20	5.8	G2	.02	1.6	.014
ADS 10075AB..	148653	16 24.5	+18 37	7.7†	K2	0.51	5.7	.040
20C 995.....	.....	16 24.7	−12 24	10.0	M5	1.24	11.7	.219
C 2200.....	148704	16 24.8	−38 47	7.5	K1	0.54	5.8	.046
4201.....	148783	16 25.4	+42 6	5.0	M6	.03	−0.6	.008
4202A....	148786	16 25.4	−16 24	4.4	G5	0.07	0.4	.016
C 2201	148816	16 25.6	+ 4 26	7.4	F7	1.45	3.6	.017
4204.....	148856	16 25.9	+21 42	3.1†	G5	0.11	0.1	.025
4206.....	148898	16 26.2	−21 15	4.6	A6s	.03	1.2	.021
4207.....	148897	16 26.2	+20 42	5.3	G4	.10	0.6	.011
ADS 10094A....	148980	16 26.7	+ 5 39	7.6	F1	.....	2.7	.010
C 2202.....	149105	16 27.4	+48 11	7.0	F8	.30	3.7	.022
4211A....	149141	16 27.8	+33 44	6.7	A2n	.04	1.9	.011
4212.....	149161	16 27.9	+11 42	4.9	M0	.20	0.0	.010
4214B....	.....	16 28.8	+45 49	8.6	F9	.03	4.2	.013
4217A....	149420	16 29.6	+30 43	7.0†	F0	.04	1.5	.008
4222.....	149661	16 31.1	− 2 7	5.9	K0	.55	5.4	.079
C 2214.....	149890	16 32.6	+31 9	7.3	F7	.48	4.0	.022
C 2217.....	149957	16 32.9	+31 19	10.0	K6	.59	7.6	.033
Anon.....	.....	16 33.0	+31 22	10	A7n	.....	2.0	.002
4228.....	150030	16 33.3	+46 49	6.0	G6	.02	0.3	.007
BD +31°2877.....	.....	16 33.4	+31 25	9.6	K5	.....	7.1	.032
BD +51°2121.....	.....	16 34.2	+51 45	9.6	G1	.12	4.0	.008
4234.....	150275	16 34.9	+77 39	6.4	K0	.29	2.2	.014
ADS 10138A....	.....	16 35.1	+38 31	8.0	A3n	.02	2.2	.007
4235.....	150365	16 35.5	−17 52	6.6	F0	.06	2.8	.017
4237(B)..	150379	16 35.6	+ 4 24	6.9	A5n	0.02	2.2	0.011

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
4239.....	150416	$16^h35^m.8$	−17°33′	5.0	G8	0″.02	0.2	0″.011
4240.....	150449	16 36.0	+56 13	5.4	K0	.08	0.9	.013
4242A....	150450	16 36.0	+49 7	5.1	M2	.04	−0.2	.009
4246A....	150680	16 37.5	+31 47	3.0	G0	.60	3.7	.138
4247.....	150682	16 37.6	+27 7	6.4†	F2‖	.05	3.8	.030
BD +66° 969.....	.....	16 38.7	+66 7	9.3	F9	.....	3.3	.006
4254.....	150937	16 39.1	−23 0	6.9	F3	.04	3.1	.017
4255A....	150997	16 39.5	+39 7	3.6	G4	.10	1.0	.030
4257A....	151090	16 40.1	+ 6 17	6.7	G6	.35	4.5	.036
4259.....	151101	16 40.2	+64 47	5.0	K2	.02	−0.2	.009
4261.....	151179	16 40.7	−25 21	6.6	G6	.02	0.7	.007
ADS 10188AB..	151188	16 40.8	+43 40	8.9†	K6	.....	7.0	.042
4262.....	151203	16 40.8	+15 56	5.8	M3	.05	−0.3	.006
4263.....	151199	16 40.9	+55 52	6.5†	A2sp*	.09	−0.1	.005
BD +33°2775.....	151216	16 41.0	+33 29	9.1	K1	.06	2.2	.004
4264A....	151217	16 41.0	+ 8 46	5.4	M0	.02	−0.1	.008
C 2238.....	151288	16 41.4	+33 41	8.2	M0	.37	8.7	.126
ADS 10201A....	151367	16 41.8	+30 11	8.7	F1	.05	3.2	.008
4267A....	151415	16 42.1	−24 21	7.5	M0	.02	0.1	.003
BD +34°2839.....	151482	16 42.5	+33 59	8.1	A4n	.02	2.0	.006
C 2242.....	151541	16 42.9	+68 16	7.6	G7	.51	4.8	.027
4270.....	151613	16 43.4	+56 58	4.9	F1	.06	3.1	.044
4272.....	151680	16 43.7	−34 7	2.4	G9	.67	0.1	.035
4273.....	151769	16 44.3	−10 36	4.7	F5	.13	2.6	.038
4275.....	151837	16 44.8	+55 35	7.0	K5	.04	0.5	.005
4279.....	151937	16 45.4	+30 8	6.7	K1	.10	−0.1	.004
BD +45°2453.....	152030	16 45.9	+45 23	8.7	F2	.04	2.9	.007
4284A....	152107	16 46.3	+46 9	4.9	A4sp*	.08	0.3	.012
ADS 10229A....	152113	16 46.4	+ 9 35	7.0†	F4	.13	3.4	.019
4286.....	152173	16 46.7	+29 59	5.9	M1	.01	−0.1	.006
4290.....	152311	16 47.5	−20 15	5.9	G1	.06	4.1	.044
4292.....	152334	16 47.5	−42 11	3.8	K5	.27	0.6	.023
4293A....	152303	16 47.5	+77 41	6.0	F1	.21	3.3	.029
4294.....	152326	16 47.6	+24 49	5.2	K1	.02	−0.6	.007
ADS 10235A....	152380	16 47.9	+28 50	6.7†	F5	0.03	3.5	.023
C 2248.....	152391	16 47.9	+ 0 11	6.8	G9	1.67	5.5	.055
4298.....	152534	16 48.8	−23 21	7.0	G7	0.03	0.9	.006
4300.....	152598	16 49.2	+31 52	5.4	A8s	.10	2.2	.023
4301.....	152601	16 49.2	− 5 59	5.4	K3	0.04	0.2	.009
TT Herculis*.....	.....	16 49.9	+17 0	9.1†	A3s	.....	1.7	.003
C 2251AB*.	152751	16 50.1	− 8 9	9.6†	M3e	1.24	10.3	.138
4303.....	152781	16 50.3	−16 39	6.5	K2	0.09	2.3	.014
4305.....	152792	16 50.4	+43 0	6.7	G0	.35	3.9	.027
4307.....	152815	16 50.6	+21 7	5.5	G7	.06	0.8	.011
4310A....	152863	16 50.9	+25 54	6.3	G4	0.03	1.1	0.009

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
4311A....	152879	16h51m0	+18°36′	5.6	K5	0″.11	0.3	0″.009
BD +75° 605.....	153143	16 52.6	+75 32	7.9†	F1	.04	2.4	.008
4314.....	153166	16 52.7	+60 31	7.2	K3	.04	0.7	.005
4315.....	153210	16 52.9	+ 9 32	3.4	K2	.30	0.5	.026
4316.....	153287	16 53.4	+25 30	6.7	G5	.01	0.7	.006
ADS 10277A....	153301	16 53.5	+15 18	8.2†	G9	.....	1.3	.004
4317.....	153344	16 53.8	+62 16	7.0	G4	.32	4.7	.035
4318.....	153336	16 53.8	−24 56	5.9	M3	.02	−0.1	.006
4319.....	153363	16 54.0	−24 50	5.8	F4	.08	2.9	.026
20C 1014.....	.....	16 54.1	+25 55	9.7	M2	.56	9.3	.083
4322.....	153597	16 55.5	+65 17	5.1†	F6	.25	3.5	.048
4323.....	153687	16 55.8	− 4 4	5.0	K4	.10	0.5	.013
4326.....	153727	16 56.0	−18 44	6.4	K0	.05	0.6	.007
4327A....	153751	16 56.2	+82 12	4.7†	G1	.02	0.3	.013
4329.....	153834	16 56.7	+22 47	5.7	K3	.03	0.0	.007
4330.....	153956	16 57.5	+56 50	6.1	K1	.05	0.8	.009
4333.....	154088	16 58.2	−28 26	6.7	G8	.29	4.8	.042
4336.....	154143	16 58.5	+14 14	5.1	M3	.07	0.1	.010
4337.....	154132	16 58.6	−25 30	6.8	A6s	.09	1.8	.010
BD +30°2925.....	.....	15 58.8	+29 58	8.6	F6	.02	2.8	.007
4339.....	154212	16 59.0	−10 57	7.1	K2	.02	0.0	.004
BD +29°2927.....	154227	16 59.1	+29 38	8.0	K3	.01	0.2	.003
4340(A)..	154228	16 59.1	+13 45	5.9	A2n	.05	2.1	.017
4341(B)..	154278	16 59.4	+13 43	6.1	G9	.14	1.0	.010
C 2277.....	154345	16 59.8	+47 12	6.7	K0	0.86	5.2	.050
4342.....	154363	16 59.8	− 4 54	7.9	M0	1.49	7.8	.096
4343.....	154356	16 59.9	+35 33	6.8	M4	0.06	−1.0	.003
C 2278.....	.....	17 0.0	− 4 56	10.0	M3	1.44	9.9	.096
C 2279.....	154417	17 0.2	+ 0 51	5.9	F8	0.32	3.9	.040
BD +29°2933.....	.....	17 0.9	+29 49	8.1	K4	.04	0.8	.003
4348A....	154660	17 1.7	− 1 31	6.2	A2n	.06	2.2	.016
ADS 10329A....	154712	17 2.0	+59 43	8.5	K5	.43	7.2	.055
4350A....	154733	17 2.1	+22 13	5.7	K4	.12	0.9	.011
4351.....	154732	17 2.2	+48 57	6.6†	K1	.09	0.7	.007
ADS 10338A....	154759	17 2.3	+47 6	8.1	K3	.05	1.1	.004
4352.....	154779	17 2.4	−17 29	6.1	K0	.02	0.6	.008
4354A....	154906	17 3.3	+54 36	5.8	F6	.11	3.3	.032
4354B....	154905	17 3.3	+54 36	5.8	F6	.11	3.3	.032
BD +73° 755.....	154928	17 3.4	+73 27	7.7	K5	.01	−0.3	.003
C 2284.....	154931	17 3.4	+ 4 34	7.3	F8	.21	3.7	.019
4356.....	155078	17 4.3	−10 24	5.6	F5	.14	3.2	.033
4360A....	155125	17 4.6	−15 36	3.1†	A2s	.09	1.3	.044
4364.....	155410	17 6.3	+40 54	5.4†	K3	.05	0.5	.010
4366.....	155644	17 7.7	+10 42	5.6	M2	0.04	−0.4	.006
ADS 10394A....	155642	17 7.8	+21 21	7.2	K2	.....	1.0	0.006

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
ADS 10394B....	.....	$17^h\ 7^m.8$	+21°21′	8.5	K0	.....	1.8	0″.005
20C 1023AB..	155876	17 9.2	+45 52	10.1†	M4	1″.56	10.3	.110
4370(B)..	155885	17 9.2	−26 27	5.3	K1	1.22	6.5	.174
4371(A)..	155886	17 9.2	−26 27	5.3	K3	1.24	6.5	.174
BD +14°3206.....	155967	17 9.7	+14 42	8.1	F2	.01	3.3	.011
C 2297.....	.....	17 9.9	+42 28	10.2	M1	1.07	8.8	.052
4372.....	156026	17 10.1	−26 24	6.7	K5	1.25	7.3	.132
4373(A)..	156014	17 10.1	+14 30	3.6†	M5	0.03	−1.9	.008
4374(B)..	156015	17 10.1	+14 30	5.7†	F8	.03	2.1	.019
BD −15°4502.....	156115	17 10.6	−15 6	6.8	M0	.....	−0.8	.003
BD +15°3141.....	156144	17 10.8	+15 2	8.3	G6	.03	0.9	.003
4376B....	.....	17 10.9	+24 57	8.3	G4	.12	3.8	.013
4379A....	156266	17 11.5	− 0 20	4.9†	K4	.06	0.2	.011
4381.....	156283	17 11.6	+36 55	3.4	K5	.02	−0.1	.c20
4383(B)..	156350	17 11.9	−24 11	6.9	F5	.08	2.8	.015
4384(A)..	156349	17 11.9	−24 11	5.4	K1	0.07	0.7	.011
ADS 10433A....	156342	17 12.0	+14 47	8.0	G0	.....	4.1	.017
4386A....	156384	17 12.1	−34 53	5.9	K5	1.16	7.0	.116
ADS 10425AB..	156389	17 12.2	+56 15	8.5†	F4	0.01	3.5	.010
BD −15°4511.....	156461	17 12.6	−15 41	7.2	G3	.....	2.5	.011
4389.....	156681	17 13.9	+10 58	5.3	K5	.10	0.1	.009
BD + 2°3295.....	156824	17 14.6	+ 2 40	8.6	F1	.....	3.0	.008
4393.....	156874	17 14.9	+28 56	5.8	G8	.04	0.3	.008
ADS 10448A....	156890	17 15.0	+60 49	6.7	A9n	.04	1.3	.008
4394.....	156897	17 15.0	−21 0	4.5	F2	.32	3.2	.055
VW Draconis.....	156947	17 15.3	+60 47	6.4*	G9	.05	0.2	.006
C 2310.....	156968	17 15.4	+ 9 34	8.2	G0	.31	4.4	.017
4397.....	156992	17 15.6	−24 48	6.6	K2	.06	0.6	.006
4400.....	157049	17 15.9	+18 10	5.2	M2	0.05	−0.5	.007
4403A....	157214	17 16.9	+32 36	5.4	G2	1.06	4.7	.c72
4407.....	157236	17 17.1	−28 3	5.4	K5	0.04	0.1	.009
4408.....	157325	17 17.5	+46 20	5.8	M0	.05	−0.4	.006
4409.....	157370	17 17.8	+71 54	6.8	K2	.02	0.4	.005
4411.....	157482	17 18.4	+40 4	6.0†	F8	.08	3.4	.030
4412.....	157498	17 18.5	− 9 16	7.8	G1	.04	4.3	.020
4413A....	157527	17 18.7	−21 21	6.0	G7	.04	0.7	.009
4414.....	157588	17 19.0	−24 9	6.3	K1	.00	0.8	.008
4420.....	157792	17 20.3	−24 5	4.3	A9s	0.13	1.8	.032
C 2322.....	157881	17 20.8	+ 2 14	7.5	K6	1.31	7.7	.110
ADS 10530A....	157906	17 21.0	+47 22	7.8	F7	.....	3.5	.014
4421.....	157919	17 21.0	−29 47	4.4	F3	0.16	2.0	.033
4422A....	157910	17 21.0	+37 2	6.5	G2	.05	0.3	.006
4423.....	157950	17 21.3	− 5 0	5.1†	F1	.10	2.8	.035
4424.....	157968	17 21.4	−12 25	6.3	F5	.08	3.4	.026
4425.....	157999	17 21.6	+ 4 14	4.4	K1	0.00	−0.2	0.012

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
ADS 10553A....	158116	17h22m3	+29°33′	7.6	A7sp*	0″.03	1.0	0″.005
ADS 10553B....	.....	17 22.4	+29 33	9.1	K1	.....	1.0	.002
C 2326.....	.....	17 22.9	+31 9	9.7	G7	.42	5.0	.011
BD +31°3026.....	158225	17 23.0	+31 21	7.0	F4	.03	3.1	.017
C 2328.....	158226	17 23.0	+31 10	8.6	G1	.32	4.1	.013
4433A....	158614	17 25.2	− 0 59	5.9†	G6	.21	4.8	.060
C 2333.....	158633	17 25.3	+67 23	6.3	K1	.54	5.8	.079
BD +68° 930.....	.....	17 26.2	+68 27	9.1	G7	.80	4.5	.012
4437AB..	158837	17 26.3	+ 2 48	6.6†	G3	.04	0.8	.007
BD + 1°3450.....	158855	17 26.5	+ 1 45	7.2	K2	.....	0.4	.004
4438.....	158899	17 26.7	+26 11	4.8†	K4	.02	0.1	.011
4440.....	158974	17 27.1	+31 14	5.8	G8	.01	0.5	.009
4443A....	159181	17 28.2	+52 23	3.0	cG2	.02	−1.7	.011
4446.....	159332	18 29.0	+19 20	5.6	F4	.10	2.7	.026
C 2339.....	159329	17 29.1	+63 56	7.4	F9	.21	3.6	.017
4447.....	159353	17 29.2	+16 23	5.7	Kc	.06	0.9	.011
4450.....	159433	17 29.7	−38 34	4.3	K1	.22	1.0	.022
4451A....	159466	17 29.8	+13 14	6.7	G4	.04	2.5	.014
4455.....	159501	17 29.9	+41 19	5.8	K1	.11	0.8	.010
ADS 10638A....	159481	17 29.9	+ 6 6	7.5	F8	.05	3.3	.014
ADS 10638C....	159482	17 29.9	+ 6 4	8.5	F8	.62	3.8	.011
4457.....	159532	17 30.1	−42 56	2.0	cF1*	.01	−1.1	.024
4458B....	159541	17 30.2	+55 15	5.0	A8s	.16	2.3	.029
4461A	159834	17 31.7	+21 4	5.8	A6s	.03	1.3	.013
4464.....	159966	17 32.4	+68 12	5.5†	G9	.14	0.5	.010
4467.....	160042	17 32.7	−21 51	6.7	G7	0.03	2.4	.014
C 2347.....	.....	17 33.4	+18 37	9.8	M1	1.35	9.2	.076
C 2348.....	.....	17 33.9	+18 37	9.1	F1	0.28	3.6	.008
4470A ...	160269	17 34.0	+61 57	5.3	G1	.56	4.2	.060
4471.....	160290	17 34.0	+48 39	5.5	K1	.06	0.7	.011
4472A....	160315	17 34.1	+ 2 5	6.4	Ko	.05	0.9	.008
BD +18°3424.....	.....	17 34.3	+18 37	9.5	K5	.09	6.4	.024
4473.....	160538	17 35.4	+74 17	7.1	Ko	.08	0.7	.005
C 2351.....	160605	17 35.8	+68 52	8.6	K2	0.15	5.1	.020
C 2353.....	160693	17 36.2	+37 16	8.4	F8	1.00	3.7	.011
C 2354.....	.....	17 37.0	+68 26	9.2	M3	1.33	10.4	.174
4480A....	160835	17 37.0	+24 34	6.5	K1	0.05	0.8	.007
4480B....	.....	17 37.0	+24 34	8.8	F1	.05	3.2	.008
BD +68° 947.....	160861	17 37.2	+68 27	8.4†	F5	.07	3.1	.009
4481.....	160915	17 37.4	−21 38	4.9	F5	.10	3.5	.052
4482A....	160910.	17 37.5	+16 0	5.6	F1	.10	3.1	.032
4483.....	160922	17 37.5	+68 48	5.2†	F4	.33	3.3	.042
4485.....	161083	17 38.4	−22 9	7.1†	A5n‖	.02	2.0	.010
4486.....	161074	17 38.4	+24 37	5.6	K5	.13	0.3	.009
4487.....	161096	17 38.5	+ 4 37	2.9	K1	0.16	0.5	0.033

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
BD −16°4603.....	161100	17h38m5	−16°50′	7.3	Fo	.....	2.3	0″.010
C 2358.....	161198	17 39.0	+21 40	7.4	G8	0″.63	5.3	.038
4488.....	161239	17 39.3	+24 22	5.7	G6	.13	1.2	.013
4492.....	161471	17 40.6	−40 5	3.1	cF6	.00	−2.1	.009
20C 1062.....	.....	17 40.9	+43 26	10.3	M3	.59	9.5	.069
ADS 10775A....	161589	17 41.2	− 4 26	9.3	G2	.....	4.3	.010
ADS 10781A....	161623	17 41.5	− 1 11	8.1	G1	.05	4.2	.017
4497A....	161797	17 42.5	+27 47	3.5	G4	.82	4.2	.138
4497B....	.....	17 42.5	+27 47	10.2†	M3	.82	10.2	.100
C 2366.....	161848	17 42.8	+ 4 59	9.0	K3	.60	6.4	.030
ADS 10777A....	161865	17 42.9	+51 59	8.6	G5	.04	0.9	.003
4503.....	161912	17 43.2	−40 3	4.9	A5sp*	.02	0.6	.014
4504(A)..	162003	17 43.7	+72 12	4.9	F5	.27	3.1	.044
4505(B)..	162004	17 43.7	+72 12	6.4†	F6	.27	3.8	.030
4506.....	162076	17 44.1	+20 36	5.8	G5	.02	2.3	.020
4508.....	162211	17 44.8	+25 39	5.3	K1	.05	0.4	.010
4510.....	162555	17 46.5	+29 21	5.6	G8	.05	0.6	.010
BD +44°2777.....	162751	17 47.5	+44 31	7.7	A4s	.04	1.3	.005
4515.....	162757	17 47.5	−10 53	6.3	K1	.07	1.0	.009
ADS 10858A....	162756	17 47.6	− 7 53	7.6	G2	.25	4.5	.024
BD +40°3225.....	162826	17 47.9	+40 5	6.5	F8	.03	3.4	.024
4516.....	162917	17 48.4	+ 6 7	6.1†	F4	.13	3.3	.027
4518.....	162989	17 48.8	+40 0	6.1	K4	.05	0.1	.006
4522A....	163217	17 50.0	+40 2	5.1	K1	.05	0.4	.011
BD +42°2951.....	163418	17 50.9	+42 40	7.6	G8	.00	0.8	.004
4526.....	163428	17 51.0	−23 56	7.1†	Mo	.00	−1.6	.002
4528.....	163506	17 51.4	+26 4	5.5	cF5	.00	−1.5	.004
4529.....	163532	17 51.5	− 4 4	5.6	G9	.03	0.8	.011
4530.....	163547	17 51.6	+22 29	5.7	K3	.00	0.2	.008
4531.....	163588	17 51.8	+56 53	3.9	K3	.12	0.6	.022
BD +45°2620.....	163589	17 51.8	+45 33	8.2	G3	.05	3.8	.013
BD +45°2621.....	163608	17 51.9	+45 13	8.0	A2n	.02	1.9	.006
ADS 10904A....	163609	17 51.9	+21 30	8.2†	G3	.08	4.2	.016
4535.....	163770	17 52.8	+37 16	4.0	cK1	0.01	−1.3	.009
Barnard's star.....	.....	17 53.0	+ 4 25	9.7	M5	10.27	12.7	.398
4536.....	163917	17 53.5	− 9 46	3.5	G9	0.12	0.5	.025
4538.....	163993	17 53.9	+29 16	3.8	G7	.09	0.6	.023
4539.....	163989	17 53.9	+76 59	5.0	F5	.24	2.9	.038
BD +45°2627.....	163990	17 53.9	+45 23	6.2	M6	.03	−0.2	.005
4540.....	164031	17 54.1	−24 17	6.7	Ko	.04	0.6	.006
4541A....	164058	17 54.3	+51 30	2.4	K5	.03	−0.1	.032
4542.....	164136	17 54.7	+30 12	4.5	F1	.00	2.0	.032
ADS 10955A....	164253	17 55.2	+30 3	7.3†	G4	.04	0.7	.005
4544.....	164259	17 55.2	− 3 41	4.9†	F1	.15	2.9	.040
4546.....	164358	17 55.6	−17 9	6.3	K3	0.01	−0.7	0.004

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
4547.....	164349	17h55m6	+16°45′	4.7	G8	0″.01	0.1	0″.012
BD −22°4510.....	164514	17 56.4	−22 54	7.3	cA8	.....	−0.7	.003
4553.....	164584	17 56.7	−24 17	5.5	A8s	.02	1.4	.015
C 2385.....	164595	17 56.8	+29 34	7.2	G1	.21	4.7	.032
4554.....	164613	17 56.9	+72 1	5.8†	F2	.01	2.3	.020
4555.....	164646	17 57.1	+45 30	5.9	Mo	.04	−0.1	.006
4556(B)..	164668	17 57.3	+21 36	5.2	G3	.03	0.7	.013
BD +30°3106.....	164755	17 57.6	+30 39	7.1	K4	.01	0.7	.005
4559A....	164765	17 57.6	− 8 11	6.1†	F3	.04	2.5	.019
ADS 11003A....	164922	17 58.4	+26 20	7.1	Ko	.72	5.4	.046
BD +30°3112.....	165073	17 59.1	+30 21	8.1	F5	0.06	3.6	.013
4571A....	165341	18 0.4	+ 2 31	4.3†	K1	1.13	5.9	.209
4571B....	.....	18 0.4	+ 2 31	6.0	K6	1.13	7.3	.182
4572B....	.....	18 0.5	+48 28	8.0	G9	0.02	0.6	.003
C 2392.....	165401	18 0.7	+ 4 39	6.8	F7	.30	4.5	.035
ADS 11045A....	.....	18 0.8	+21 26	8.4†	F9	.....	3.3	.010
4574.....	165438	18 0.9	− 4 46	5.9	K1	.15	2.1	.017
BD +42°2996.....	165566	18 1.4	+42 51	7.5	Ko	.02	−0.3	.003
ADS 11060A....	165590	18 1.6	+21 26	7.9†	G1	.05	3.6	.014
4578.....	165625	18 1.8	+22 13	5.3	M2	.02	−0.4	.007
4579.....	165687	18 2.0	−17 10	5.7	K1	.12	0.7	.010
C 2396.....	165670	18 2.1	+ 8 52	8.0†	F5	.15	4.0	.016
4580.....	165760	18 2.5	+ 8 43	4.7	G8	.02	0.4	.014
4581A....	165777	18 2.6	+ 9 33	4.2†	A5s	.10	1.5	.029
BD −21°4866.....	165784	18 2.6	−21 28	6.6	F2	.04	3.1	.020
4582A....	165908	18 3.2	+30 33	5.2	F5	.11	4.1	.060
BD −15°4832.....	165945	18 3.3	+15 33	9.2	A6sp*	.....	1.1	.002
W Serpentis.....	166126	18 4.1	−15 34	8.5	cG5e*	.....	−3.7	.000
4589.....	166208	18 4.5	+43 27	5.1	G5	.07	0.7	.013
4593.....	166229	18 4.6	+36 23	5.7	K4	.21	0.7	.010
4594A....	166233	18 4.6	+ 3 59	6.2†	A7n	.04	1.7	.013
4595A....	166285	18 4.9	+ 3 6	5.7	F4	.19	3.0	.029
BD −16°4744.....	166418	18 5.4	−16 44	8.7	G1	.....	4.5	.014
4596A....	166464	18 5.6	−23 43	5.1	Ko	.04	0.8	.014
ADS 11123A....	166479	18 5.7	+16 27	6.5†	F3	.02	3.9	.030
4597.....	166460	18 5.7	+ 3 18	5.7	K2	.03	0.3	.008
BD +56°2068.....	166494	18 5.8	+56 47	8.2	G2	.08	3.5	.011
BD +43°2897.....	166516	18 5.9	+43 33	8.1	Ko	.02	0.4	.003
C 2403.....	166620	18 6.3	+38 27	6.4	K2	.57	5.9	.079
4601.....	166640	18 6.5	+36 27	5.9	G7	.01	0.5	.008
4602(B)..	166865	18 7.5	+79 59	6.7†	F5	.13	3.4	.022
4603(A)..	166866	18 7.6	+79 59	6.1†	F6	.12	3.2	.026
4606.....	167006	18 8.1	+31 23	5.0	M3	.02	−0.1	.010
4607.....	167036	18 8.3	−21 44	5.7	K3	.03	0.5	.009
4608.....	167027	18 8.3	+56 15	7.5	K3	0.04	0.4	0.004

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
4609.....	167042	18h 8m.5	+54°15′	5.9	K0	0″.27	2.2	0″.018
BD +33°3048.....	167063	18 8.5	+33 15	7.1	M0	.02	−0.6	.003
BD −15°4889.....	167246	18 9.2	−15 25	7.3	K1	.....	0.9	.005
4616.....	167570	18 10.6	−20 35	7.1	G2	.02	0.9	.006
4617A....	167618	18 10.9	−36 48	3.2	M4	.22	0.1	.024
4618.....	167768	18 11.6	− 3 2	6.1	G1	.27	0.8	.009
4619.....	167818	18 11.8	−27 5	4.7	K5	.01	−0.4	.010
4622A....	168092	18 12.9	+56 33	6.9†	F1‖	.03	2.7	.014
4623.....	168151	18 13.3	+64 22	5.0	F3	.35	3.5	.050
4624.....	168322	18 13.9	+40 54	6.1	G4	.18	1.1	.010
4626A....	168387	18 14.3	+ 7 13	5.6	K2	.06	0.8	.011
4627.....	168415	18 14.4	−15 52	5.7	K5	.05	0.3	.008
ADS 11262A....	168459	18 14.6	− 8 1	6.6†	F2	.....	2.4	.014
4628A....	168454	18 14.6	−29 52	2.8	K2	.05	0.0	.027
4629.....	168532	18 15.1	+24 24	5.8†	K4	.02	0.0	.007
4630.....	168574	18 15.4	−24 58	6.4	M5	.01	−0.8	.004
4634.....	168653	18 15.9	+68 43	6.1	K1	.06	0.7	.008
4635A....	168656	18 15.9	+ 3 20	4.9	G5	.02	0.4	.013
4636.....	168720	18 16.1	+21 55	5.0	M0	.06	−0.1	.010
4638A....	168723	18 16.1	− 2 55	3.4	G8	.90	1.4	.040
4639.....	168775	18 16.4	+36 1	4.3	K1	.04	0.9	.021
ADS 11282A....	168815	18 16.5	−15 8	7.4	K5	.....	−1.1	.002
ADS 11282BC..	.....	18 16.5	−15 8	8.6†	F2	.....	3.1	.008
ADS 11275A....	168874	18 16.8	+27 29	7.1	G4	.12	5.0	.038
4647.....	169028	18 17.6	+51 18	6.5†	K1	.06	0.6	.007
4649.....	169110	18 18.0	+23 14	5.7	K5	.08	0.1	.008
BD + 7°3661.....	169113	18 18.0	+ 7 9	7.6	K2	.01	0.5	.004
4650.....	169156	18 18.2	− 8 59	5.1†	K0	.06	0.7	.013
BD −12°5031.....	169170	18 18.3	−12 38	8.1	K1	.05	0.4	.003
4651.....	169191	18 18.4	+17 47	5.5	K2	.06	0.3	.009
4653.....	169305	18 19.0	+49 4	5.1	M2	.06	−0.1	.009
4655A....	169420	18 19.4	−20 36	5.0	K1	.02	0.3	.011
4656.....	169414	18 19.4	+21 43	3.9	K2	.32	0.7	.023
ADS 11326A....	169457	18 19.6	−16 33	9.8†	F3	.....	2.7	.004
ADS 11326B....	.....	18 19.6	−16 33	10.8	F8	.....	3.2	.003
BD +43°2962.....	169510	18 19.9	+43 53	8.2	G7	.00	0.8	.003
BD + 9°3699.....	169576	18 20.3	+ 9 41	7.9	K2	.02	0.3	.003
4659.....	169666	18 20.7	+71 28	7.8	F2	.07	3.3	.013
4660.....	169689	18 20.8	+ 7 59	6.0†	F9	.00	0.9	.010
BD +43°2970.....	169746	18 21.1	+43 51	7.0	M2	.04	−0.5	.003
C 2420.....	169822	18 21.4	+ 8 44	7.9	G2	.55	4.5	.021
BD +15°3463.....	169840	18 21.5	+15 42	7.4	F4	.....	2.8	.012
C 2421.....	169889	18 21.6	+ 8 34	8.3	G7	.51	4.7	.019
4665.....	169916	18 21.8	−25 29	2.9	K1	.20	0.7	.036
BD + 8°3696.....	169957	18 22.0	+ 8 3	8.9	G0	0.16	4.0	0.010

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
4669.....	169981	18^h22^m1	+29°46′	6.0†	A4s	0″.03	1.1	0″.010
4672.....	170153	18 22.9	+72 41	4.0†	F5	.64	4.0	.100
C 2423.....	170357	18 23.9	+46 1	8.3	Go	.40	4.0	.014
4675.....	170397	18 24.1	−14 39	6.0	A2s*	.02	1.3	.011
4676.....	170433	18 24.3	−18 48	5.8	Ko	.11	0.7	.010
4678.....	170474	18 24.5	− 2 3	5.7†	G8	.04	0.6	.010
BD +44°2906.....	170615	18 25.3	+44 11	7.7	K2	.01	0.5	.004
4684.....	170657	18 25.5	−18 58	7.0	Ko	.24	5.5	.050
4686.....	170693	18 25.7	+65 30	5.0	K1	.10	0.4	.012
BD + 7°3724.....	170780	18 26.1	+ 8 1	7.6	M2	.03	−0.5	.002
4688.....	170811	18 26.3	+59 29	6.5	G8	.06	0.8	.007
4694.....	170975	18 27.0	−14 56	5.9	cK5	.01	−2.5	.002
4698.....	171115	18 27.8	−24 6	5.7	cK4	.02	−2.2	.003
4700.....	171237	18 28.4	−24 18	6.4	cF3	.00	−0.8	.004
4701.....	171245	18 28.6	+23 33	6.0	K5	.01	−0.2	.006
4703.....	171391	18 29.5	−11 3	5.2	G7	.05	0.5	.011
4704.....	171416	18 29.6	−29 47	6.5	Ko	.03	0.4	.006
4705.....	171443	18 29.8	− 8 19	4.1	K5	.32	0.3	.017
ADS 11477A....	171586	18 30.6	+ 4 51	6.7	A4sp*	.04	0.8	.007
4707.....	171635	18 30.8	+56 58	5.0	cF8	.01	−2.0	.004
4708AB..	171745	18 31.3	+23 31	6.4†	G8	.02	0.6	.007
BD +65°1277.....	.....	18 31.6	+65 18	8.7	Fo	.02	3.2	.008
4711AB..	171779	18 31.7	+52 16	5.4	G5	.01	0.4	.010
4712.....	171802	18 31.7	+ 9 3	5.4	F2	.13	3.0	.033
4713A....	171834	18 31.8	+ 6 36	5.7†	F1	.15	2.9	.027
4716.....	171893	18 32.1	−17 19	6.8	F3	.01	2.5	.014
20C 1095.....	.....	18 32.4	+45 39	9.8	M2	.56	8.5	.055
C 2446.....	172085	18 33.1	+24 21	7.4	F9	.15	3.5	.017
ADS 11520AB..	172088	18 33.2	− 3 17	7.2	F8	*	3.9	.022
C 2447.....	.....	18 34.3	+20 33	9.1	F9	.25	3.2	.007
C 2448.....	172310	18 34.4	+28 51	8.2	G8	.48	5.5	.029
4723A....	172323	18 34.5	+63 37	8.1	F6	.25	4.0	.015
4724.....	172340	18 34.6	+77 28	5.8	K4	.01	−0.1	.007
4726.....	172546	18 35.8	−23 56	6.1	Fo	.04	2.7	.021
ADS 11560A....	172586	18 36.0	+24 37	8.0	G7	.03	0.7	.003
4728A....	172712	18 36.6	+52 15	7.5†	A1n	.01	2.3	.009
4728B....	172713	18 36.6	+52 15	7.7	Go	.01	3.3	.013
4729.....	172711	18 36.6	+55 9	7.6	F6	.06	2.9	.011
4731A....	172748	18 36.8	− 9 9	5.0†	F4	.01	1.4	.019
ADS 11576A....	.....	18 37.1	+31 28	8.5	K4	.82	6.3	.036
4736A....	173009	18 38.1	− 8 22	5.1	G5	.02	0.1	.010
4741A....	173399	18 40.0	+44 50	7.1	G2	.04	2.5	.012
4742.....	173417	18 40.1	+31 50	5.5	F2	.15	2.4	.024
4743A....	173460	18 40.3	−22 30	5.8	K4	0.03	−0.2	.006
RZ Ophiuchi*.....	.....	18 40.9	+ 7 7	10.4†	cF7e	.....	−1.8	0.000

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
4747(A)..	173582	18h41m0	+39°34′	5.4	A2n	0″.05	1.8	0″.019
4748(B)..	173583	18 41.0	+39 34	6.0	A4n	.06	1.6	.013
4749(A)..	173607	18 41.1	+39 30	5.1	A3n	.06	1.8	.022
4750A....	173638	18 41.2	−10 14	5.8	cF4	.01	−0.5	.005
4751A....	173654	18 41.3	− 1 4	5.7	A6s	.03	1.8	.017
4752A....	173648	18 41.3	+37 30	4.6†	A9s	.03	1.8	.027
BD +44°2983.....	173666	18 41.4	+44 47	7.8	F4	.03	2.1	.007
4753A....	173667	18 41.4	+20 27	4.3	F3	.34	3.1	.057
4754D....	173649	18 41.4	+37 29	5.9	A3n	0.02	1.9	.016
ADS 11632A....	173739	18 41.8	+59 27	8.8	M4	2.31	10.9	.263
ADS 11632B....	173740	18 41.8	+59 27	9.7	M5	2.25	12.1	.302
4756.....	173764	18 41.9	− 4 51	4.8†	cG7	0.02	−1.9	.005
4758.....	173780	18 42.0	+26 33	4.9	K1	.03	0.6	.014
4761.....	173880	18 42.6	+18 4	4.7†	A4s	.12	1.9	.027
4763A....	173949	18 43.1	+60 57	6.3†	G7	.01	2.3	.016
BD + 0°4023.....	174066	18 43.6	+ 0 25	8.5	G7	.18	4.5	.016
4764A....	174116	18 43.7	−20 26	5.7†	K1	.03	0.0	.007
BD −10°4819.....	174142	18 44.1	−10 29	7.9	K2	.01	0.2	.003
ADS 11711A....	174224	18 44.4	+16 9	8.3†	F7	.06	3.2	.010
C 2463.....	.....	18 44.5	+17 20	9.2	M1	.61	8.3	.066
4767A....	174309	18 44.8	−22 17	6.2	A6n	.04	1.8	.013
ADS 11698A....	174343	18 44.9	+49 19	7.8†	F1	.01	2.3	.008
BD +45°2777.....	174504	18 45.7	+45 9	6.8	A9s	.11	2.3	.013
ADS 11752A....	174512	18 45.7	− 6 23	8.0	A6sp	.....	1.0	.004
BD − 6°4932.....	174553	18 45.9	− 6 28	9.9	F6	.....	2.8	.004
4773.....	174589	18 46.1	− 3 26	6.0	A6n	.04	1.5	.013
BD +45°2779.....	174600	18 46.2	+45 11	8.6	K4	.05	0.6	.003
4777(E)..	.....	18 46.4	+33 15	10.0	F2	.....	3.1	.004
4780.....	174947	18 48.0	−21 29	5.8	cK0	.01	−1.4	.004
4781A....	174974	18 48.1	−22 52	5.0	cK2	.02	−2.9	.003
4782.....	174980	18 48.3	+73 58	5.4	G8	.08	0.6	.011
ADS 11790A....	175018	18 48.4	+ 3 16	8.7	F3	.....	3.1	.008
ADS 11790B....	.....	18 48.4	+ 3 16	9.2	F3	.....	3.0	.006
4785.....	175190	18 49.1	−22 48	5.3†	K5	.10	−0.1	.008
4787.....	175225	18 49.3	+52 51	5.6	G8	.29	4.7	.066
4790A....	175306	18 49.7	+59 16	5.1†	G5	.09	0.4	.011
4791.....	175317	18 49.8	−16 30	5.6	F5	.19	2.9	.029
4795.....	175466	18 50.3	+42 47	6.9	K5	.03	−0.1	.004
4797A....	175492	18 50.5	+22 31	4.9†	G0	.00	0.5	.013
4798.....	175515	18 50.6	+ 6 29	6.0†	G9	.09	0.7	.009
C 2471.....	175518	18 50.6	− 5 52	8.2	G8	.42	5.3	.026
4799.....	175535	18 50.7	+50 35	5.0	G4	.03	0.8	.014
4800A....	175588	18 51.0	+36 46	4.5	M4	.01	−1.6	.006
4801A....	175635	18 51.2	+33 50	6.4†	G2	.01	0.3	.006
4805A....	175740	18 51.7	+41 28	5.6	G8	0.01	0.6	0.010

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
4807.....	175743	18h51m7	+17°59′	5.7	K2	0″.18	0.7	0″.010
4808.....	175751	18 51.7	− 5 59	5.0	K2	.07	0.3	.011
4809.....	175775	18 51.8	−21 14	3.6	K1	.04	0.0	.019
4811A....	175824	18 52.1	+48 44	5.9	F4	.14	2.9	.025
R Lyrae *.....	175865	18 52.3	+43 49	4.3	M5	0.08	−0.9	.009
C 2475.....	176029	18 53.1	+ 5 48	9.3	M1	1.26	9.2	.096
4815A....	176051	18 53.3	+32 46	5.2	Go	0.22	4.6	.076
4818.....	176232	18 54.2	+13 46	5.9	A6sp*	.05	0.7	.009
4819.....	176246	18 54.3	−25 5	6.4	Ko	.05	1.2	.009
4820A....	176303	18 54.5	+13 29	5.4	F6	.12	3.0	.033
4822.....	176408	18 55.1	+57 41	5.7	K3	.07	0.7	.010
4823.....	176411	18 55.1	+14 56	4.5†	Ko	.10	0.5	.016
ADS 11916A....	176486	18 55.3	+12 44	7.1	K4	.04	0.0	.004
4825.....	176524	18 55.6	+71 10	5.2†	Ko	.07	0.1	.010
4826.....	176527	18 55.7	+26 6	5.3	K2	.09	0.7	.012
4828.....	176593	18 55.8	−15 25	6.4	G6	.01	0.4	.006
4829.....	176598	18 56.0	+65 7	5.8	G5	.04	0.6	.009
BD +18°3909.....	176646	18 56.1	+18 20	8.0	G5	.02	0.6	.003
4831.....	176670	18 56.2	+32 0	5.1	K3	.01	−0.3	.008
4832A....	176687	18 56.2	−30 1	3.1†	A4n	.02	1.5	.048
4834.....	176678	18 56.3	− 5 53	4.2	K1	.05	0.6	.019
4835.....	176704	18 56.3	−24 59	5.7	K4	.18	0.2	.008
C 2483.....	230409	18 56.4	+18 57	10.0	G4	.62	4.8	.009
βGC 8983A....	176916	18 57.4	+ 8 37	8.3	G4	.01	0.6	.003
βGC 8983B....	176915	18 57.4	+ 8 37	9.1	G1	.04	0.4	.002
4840A....	176982	18 57.6	− 0 51	8.5	G5	.14	4.5	.016
4840B....	176983	18 57.6	− 0 51	9.4†	G6	.01	4.8	.012
C 2487.....	177095	18 58.0	−20 35	9.4	G3	.71	4.2	.009
4846A....	177196	18 58.6	+46 48	5.1	A4n	.09	1.6	.020
4847A....	177241	18 58.7	−21 53	3.9	G8	.10	0.7	.023
4848.....	177249	18 58.7	+55 31	5.5	G2	.02	0.9	.012
ADS 11977A....	177279	18 58.9	+31 16	9.1†	A7s	.01	1.9	.004
BD + 1°3872.....	.....	18 59.2	+ 1 13	10.8†	G5	.....	4.5	.005
4851A....	177474	18 59.7	−37 12	5.0	F7	.30	3.6	.052
4851B....	177475	18 59.7	−37 12	5.0	F7	.30	3.5	.050
4852(B)..	177442	18 59.7	− 4 11	7.2	K4	.04	0.7	.005
4853(A)..	177463	18 59.7	− 4 11	5.5	K1	.03	0.3	.009
4855A....	177483	18 59.8	+52 7	6.5†	G8	.03	0.2	.005
4857.....	177716	19 0.7	−27 49	3.7†	K1	.27	0.7	.025
ADS 12029A....	177749	19 0.9	+ 6 24	6.9	F4	.08	3.0	.017
ADS 12029B....	.....	19 0.9	+ 6 24	8.9	G4	.08	4.8	.015
C 2490.....	177758	19 0.9	−12 2	7.1	F7	.42	3.8	.022
BD +30°3409.....	177809	19 1.1	+30 35	6.4	M2	.03	−0.2	.005
4860.....	177808	19 1.2	+31 36	5.8	K5	.08	0.2	.008
BD +29°3472.....	178003	19 1.9	+29 46	6.6	Mo	0.04	−0.3	0.004

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
	4863.....	178089	$19^h\ 2^m.2$	+76°54′	6.5	F3	0″.08	3.0	0″.020
C	2492.....	178126	19 2.2	+ 7 29	9.5	K6	.81	7.7	.044
ADS	12040A....	178091	19 2.3	+30 17	8.5†	G2	.07	4.3	.014
ADS	12040B....	.....	19 2.3	+30 17	9.7	G7	.07	4.6	.010
ADS	12050A....	178211	19 2.6	+22 1	7.4†	F1	.07	3.1	.014
C	2495.....	178428	19 3.5	+16 42	6.3†	G4	.31	4.9	.052
	4872A....	178449	19 3.6	+32 21	5.0	A7n	.12	2.0	.025
C	2496.....	178450	19 3.6	+30 6	8.1	G5	.14	4.7	.021
C	2497.....	178496	19 3.7	−21 37	8.7	G4	.45	4.5	.014
	4874.....	178524	19 3.8	−21 11	3.0	cF3	.04	−0.5	.020
	4877.....	178770	19 4.8	+39 0	7.6	M6	.01	−0.9	.002
ADS	12101A....	178911	19 5.4	+34 26	6.5	G1	.19	4.2	.035
	4879.....	179130	19 6.2	−14 45	7.4	K3	.05	0.2	.004
	4880.....	179201	19 6.5	−21 49	6.7†	G8	.03	0.5	.006
	4881.....	179323	19 7.1	−26 4	5.9	cK0	.02	−1.2	.004
ADS	12145A....	179484	19 7.7	+38 37	8.2†	G4	.27	4.9	.022
ADS	12145BC..	.....	19 7.7	+38 37	8.7	K0	.27	5.5	.023
	4884.....	179497	19 7.7	−12 27	5.6	K3	.04	0.6	.010
ADS	12160C....	179558	19 8.1	+16 41	7.9	G6	.24	4.8	.024
C	2509.....	179626	19 8.2	− 0 45	9.3	F4	.53	3.5	.007
BD	+14°3830.....	179785	19 8.8	+14 46	7.4	K4	.02	0.2	.004
BD	+14°3831.....	179786	19 8.8	+14 26	7.8	M2	.03	−0.6	.002
	4891A....	179950	19 9.4	−25 26	6.1†	F5	.05	3.1	.025
	4892(B)..	179957	19 9.5	+49 40	6.8	G5	.63	4.8	.040
	4893(A)..	179958	19 9.5	+49 40	6.6	G3	.65	4.6	.040
	4894.....	180006	19 9.8	+56 41	5.2	G7	.06	0.6	.012
ADS	12201A....	180054	19 9.9	+18 54	7.9†	F5	.02	3.6	.014
	4898A....	180262	19 10.8	+14 55	5.7	G7	.02	0.5	.009
	4901A....	180409	19 11.3	−11 9	7.0	F7	.14	3.9	.024
	4903.....	180540	19 11.8	−19 8	5.0	G5	.02	0.6	.013
	4907.....	180610	19 12.1	+57 32	5.3	K2	.08	0.9	.013
	4909.....	180711	19 12.5	+67 29	3.2	G8	.13	0.4	.027
	4910A....	180756	19 12.7	+49 54	6.3	G6	.01	0.9	.008
	4912A....	180809	19 12.9	+37 57	4.5	G9	.01	−0.6	.010
	4915.....	180928	19 13.3	−15 43	6.3	K4	.28	0.6	.007
	4916A....	180972	19 13.5	+ 0 54	5.3	K0	.02	0.7	.012
	4919A....	181053	19 13.7	+ 0 9	6.5	G9	.01	0.4	.006
	4920.....	181096	19 14.0	+46 49	6.0	F3	.28	3.0	.025
	4923.....	181276	19 14.8	+53 11	4.3†	G8	.13	0.5	.017
	4926.....	181391	19 15.2	− 5 36	5.4†	K0	.11	2.3	.024
20C	1145.....	.....	19 15.7	+41 28	8.7	K1	.66	5.9	.027
	4932.....	181577	19 15.9	−18 2	4.0	F0	.03	2.3	.046
	4935.....	181645	19 16.0	−18 30	6.0	G9	.13	0.7	.009
	4937.....	181907	19 17.2	− 0 27	6.0	G8	.05	0.6	.008
	4940.....	181984	19 17.5	+73 10	4.9†	K4	0.18	0.5	0.013

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
4944	182416	19h19m4	−24°10′	5.6	K4	0″.02	0.4	0″.009
4945	182477	19 19.7	−14 6	5.8	K3	.09	0.3	.008
4950	182572	19 20.2	+11 44	5.2	G7	.96	4.5	.072
4953	182640	19 20.5	+ 2 55	3.4	A5n	.26	1.9	.050
4958	182694	19 20.8	+43 12	6.0	G5	.05	0.6	.008
4960A	182762	19 21.1	+19 36	5.3	G7	.11	0.3	.010
4961A	182807	19 21.3	+24 44	6.2	F6	.66	3.6	.030
4962A	182835	19 21.4	+ 0 8	4.9	cF5	.01	−2.0	.004
4963	182900	19 21.8	+12 49	5.8	F3	.07	2.8	.025
4964	182926	19 21.8	−18 33	7.3	F4	.02	3.4	.017
4966	182917	19 21.9	+50 3	7.1	M7	.02	−0.5	.003
4967A	182955	19 22.1	+19 42	6.0	M0	.06	0.9	.010
4968	182998	19 22.3	−18 34	6.9	K5	.02	0.3	.005
4971	183030	19 22.5	+88 59	6.6	M4	.03	−0.3	.004
ADS 12447AB	183032	19 22.5	+27 7	8.5†	F9	.13	3.8	.011
ADS 12469A	183063	19 22.6	−12 21	8.0†	G7	.08	5.0	.025
4973A	183275	19 23.7	−27 11	5.5	K3	.05	0.4	.010
4976(A)	183439	19 24.5	+24 28	4.6	M1	.17	0.1	.013
BD +42°3351	183473	19 24.7	+42 33	8.6	G3	.17	4.2	.013
4977	183492	19 24.8	+14 23	5.7	K0	.05	0.5	.009
4978(B)	183491	19 24.8	+24 34	6.0	G6	.01	0.6	.008
BD +14°3937	183511	19 24.9	+14 58	8.0	cK4	.....	−1.7	.001
4983	183630	19 25.4	− 3 0	5.2	M1	.02	−0.2	.008
4985	183877	19 26.4	−28 13	7.0	G6	.74	4.7	.035
4986(A)	183912	19 26.7	+27 45	3.8†	K0‡	.01	−0.7	.013
BD +59°2038	183968	19 27.0	+59 34	7.8	K4	.02	0.3	.003
ADS 12557A	231683	19 27.2	+17 35	9.2	G2	.13	4.5	.011
20C 1156	.....	19 27.3	+35 57	10.4	F1	.56	3.6	.004
4993	184268	19 28.5	−24 5	6.7	K5	.00	0.0	.005
4994	184293	19 28.7	+50 6	5.7	K2	.05	0.6	.010
ADS 12594A	184360	19 29.0	+20 12	7.2	A5sp*	.06	0.8	.005
4995A	184406	19 29.2	+ 7 10	4.6	K4	.27	0.9	.018
C 2554	184467	19 29.5	+58 23	6.7	K5	.67	6.1	.076
C 2556	184489	19 29.6	+ 4 21	10.5	M1	.58	8.7	.044
4996	184492	19 29.6	−10 47	5.2	G7	.00	0.4	.011
C 2558	184499	19 29.7	+32 59	6.6	G1	.52	4.2	.033
4997	184552	19 30.0	−24 56	6.0†	A7s	.03	1.7	.014
5000	184759	19 30.9	+29 15	5.9†	F4‡	.02	3.5	.033
ADS 12661A	184853	19 31.3	+ 5 47	6.7	G5	.....	0.3	.005
ADS 12664A	184860	19 31.3	−10 39	8.7†	K5	.39	6.8	.042
5001	184835	19 31.3	−18 27	5.9	K3	.03	0.2	.007
5005	184960	19 31.7	+51 1	5.6	F6	.20	3.2	.033
5006	184985	19 31.9	−14 31	5.6	F6	.18	3.6	.040
5008	185124	19 32.5	− 4 52	5.5	F1	0.12	3.0	.032
5009	185144	19 32.6	+69 29	4.8	G8	1.84	5.6	0.145

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. m	Sp.	μ	Vis. M	Spec. π
5010A....	185194	$19^h32^m.8$	+16°14′	5.7	G8	0″.02	0.2	0″.008
ADS 12708A....	185207	19 33.3	+ 0 7	7.4	A3n	.06	2.1	.009
5012.....	185351	19 33.5	+44 28	5.2	K0	.14	2.4	.027
5013.....	185394	19 33.7	+63 13	6.6	K4	.02	0.1	.005
5014A....	185395	19 33.8	+49 59	4.6	F2	.25	3.4	.057
5016.....	185467	19 34.1	−23 39	6.1	K1	.02	0.4	.007
5019A....	185644	19 35.0	−16 31	5.4	K1	.08	0.5	.010
5020A....	185713	19 35.4	+71 23	6.9†	F1	.13	3.4	.020
5021.....	185734	19 35.4	+29 55	5.3†	K0	.04	0.7	.012
5023A....	185758	19 35.6	+17 47	4.4	cF8	.04	−1.4	.007
ADS 12730A....	185855	19 36.0	+63 36	8.7	F1	.....	3.1	.008
ADS 12730B....	.....	19 36.0	+63 36	10.4	A8n	.....	2.0	.002
5026.....	185912	19 36.4	+54 44	6.4†	F4	.18	3.0	.021
5027.....	185958	19 36.6	+17 15	4.4	G7	.04	0.0	.013
5031.....	186155	19 37.8	+45 17	5.0	F5	.14	1.8	.023
5033A....	186203	19 37.9	+11 35	5.6†	F3	.01	2.9	.029
5037(A)..	186408	19 39.2	+50 18	6.3	G3	.22	4.8	.050
5038(B)..	186427	19 39.2	+50 17	6.4	G2	.22	4.4	.040
5039.....	186486	19 39.6	+25 32	5.4	G6	.01	0.5	.010
ADS 12850A....	186518	19 39.8	+26 54	7.2†	G4‡	.06	0.5	.005
5043.....	186619	19 40.4	+41 32	6.0	M0	.02	−0.2	.006
5044.....	186648	19 40.5	−20 0	5.1	K0	.16	0.7	.013
5045.....	186675	19 40.7	+37 7	5.0	G8	.08	0.5	.013
5047.....	186791	19 41.5	+10 22	2.8	K4	.01	−0.8	.019
ADS 12889A....	186858	19 41.8	+33 22	8.3†	K5	.43	6.6	.046
ADS 12889B....	.....	19 41.8	+33 22	8.5	K5	.43	6.6	.042
5049A....	186927	19 42.1	+34 46	6.2	K0	.01	0.8	.008
5051A....	187013	19 42.6	+33 30	5.0	F3	.45	3.4	.048
5051B....	.....	19 42.6	+33 30	8.4	K6	.45	6.8	.048
5052.....	187076	19 42.9	+18 17	3.8	M2	.01	−1.2	.010
BD +44°3242.....	.....	19 43.4	+44 49	9.6	M3	.02	−0.3	.001
5053.....	187195	19 43.5	−11 7	6.2	K5	.04	0.7	.008
5055A....	187259	19 44.0	+11 34	6.1†	F2	.01	3.6	.032
ADS 12972A....	187458	19 45.0	+35 4	6.9†	F2	.12	3.4	.020
5062A....	187642	19 45.9	+ 8 36	0.9	A1n	.66	2.3	.191
5063A....	187638	19 45.9	+38 27	6.2	G3	.02	0.5	.007
5065A....	187691	19 46.2	+10 10	5.2	F8	.27	3.9	.055
5066.....	187739	19 46.4	−19 18	6.0	G5	.06	1.3	.011
ADS 13010A....	187810	19 46.8	+44 54	8.3	K0	.02	0.6	.003
5069A....	187849	19 47.0	+38 28	5.4	M2	.10	−0.6	.006
BD +8°4245.....	187894	19 47.3	+ 8 49	9.8	F7	.....	3.0	.004
5074.....	188041	19 48.1	− 3 22	5.6	A5sp*	.02	0.1	.008
5075.....	188056	19 48.1	+52 44	5.2	K4	.07	0.5	.011
5076A....	188088	19 48.3	−24 11	6.3	K5	.43	6.3	.100
5079A....	188119	19 48.5	+70 1	4.0	G3	0.09	0.9	0.024

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
5079B	.....	19^h48^m5	+70° 1′	7.1	F6	0″09	3.0	0″015
5082A	188154	19 48.7	− 8 50	6.0	K5	.02	0.3	.007
BD +16°4053	188262	19 49.2	+16 31	7.6	cF8	.01	−0.2	.003
5089	188310	19 49.4	+ 8 12	4.9	Ko	.13	0.9	.016
C 2596	188326	19 49.5	+38 30	8.0	G4	.34	4.6	.021
5091	188376	19 49.7	−26 34	5.1†	G5	.22	3.6	.050
5093A	188512	19 50.4	+ 6 9	3.9	G8	.48	4.0	.105
5095	188603	19 50.8	−27 26	4.9†	K3	.02	−0.2	.010
5096	188650	19 51.2	+36 44	5.8	F6	.01	2.1	.018
BD +39°3959	188875	19 52.2	+39 55	6.7	K5	.01	−0.5	.004
5103A	188947	19 52.6	+34 49	4.0	Ko	.05	0.3	.018
5104	189005	19 52.9	−26 28	5.3†	G5	.04	0.9	.013
5106	189063	19 53.1	+60 33	7.3	M1	.01	−0.5	.003
5114	189231	19 53.8	+64 27	6.9	K1	.00	0.2	.005
5115	189245	19 53.9	−33 58	5.7	F4	.34	3.2	.032
5116	189276	19 54.0	+58 35	5.1	K5	.02	−0.2	.009
5118	189319	19 54.3	+19 13	3.7	Mo	.06	−0.1	.017
5119A	189340	19 54.4	−10 13	5.9	F8	.49	3.8	.038
BD +29°3829	189379	19 54.6	+29 40	7.4	A4n	.01	1.9	.008
ADS 13196A	189378	19 54.7	+33 0	7.6†	F2	.06	3.3	.014
5125A	189577	19 55.5	+17 15	5.6	M4	.02	−0.6	.006
C 2607	189558	19 55.5	−12 31	7.6	F6	.50	3.4	.014
5129	189763	19 56.5	−27 59	4.6	M4	.04	−0.1	.011
BD +53°2335	235062	19 56.7	+53 17	8.5	G5	.02	3.9	.012
ADS 13256A	189783	19 56.7	+10 28	7.8†	F4	.....	3.3	.013
5134A	190004	19 57.8	+24 39	5.9†	Fo	.10	2.0	.017
C 2616	190067	19 58.0	+15 20	7.2	G7	.60	5.2	.040
BD +35°3920	190113	19 58.3	+35 21	8.0	cKo	.03	−2.3	.001
5137A	190147	19 58.5	+49 50	5.3	G9	.02	0.4	.010
5142	190299	19 59.2	− 0 59	5.8	K4	.12	0.4	.008
5143	190327	19 59.3	+ 7 0	5.6	Ko	.02	0.4	.009
5144	190360	19 59.5	+29 38	5.7	G8	.85	4.6	.060
5146	190406	19 59.6	+16 48	5.9	G1	.57	4.4	.050
BD +29°3873	190403	19 59.7	+29 42	6.8	G5	0.02	−0.5	.003
C 2620	190404	19 59.7	+23 5	7.2	K3	1.37	6.0	.057
5149A	190544	20 0.4	+64 32	5.4	M1	0.02	−0.2	.008
5151	190608	20 0.7	+19 42	5.3	K1	.08	0.8	.013
5152A	190713	20 1.2	+64 21	6.6	G7	.05	1.0	.008
5153	190940	20 2.4	+67 35	4.7	K2	.05	0.3	.013
5154	190960	20 2.4	+76 12	6.4	M3	.06	0.0	.005
5157	191026	20 2.6	+35 42	5.5	G3	.50	4.5	.063
5159	191067	20 2.9	− 0 58	6.0	K1	.13	0.8	.009
5162A	191174	20 3.5	+63 36	6.2	A3s	.05	1.1	.010
5163	191195	20 3.6	+52 52	5.7	F4	.33	3.3	.033
BD +36°3883	191226	20 3.7	+36 17	7.4	M2	0.01	−0.7	0.002

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
5165.....	191277	20h 4m0	+61°42′	5.6	K3	0″.14	0.9	0″.011
5166.....	191408	20 4.6	−36 21	5.3	K4	1.63	6.7	.191
ADS 13434A....	191499	20 5.0	+16 30	7.7	G9	0.17	5.8	.042
5167(C)..	191571	20 5.5	+20 36	7.6†	K2	.01	0.1	.003
5168(B)..	.....	20 5.5	+20 37	8.4	G5	.12	4.7	.018
5169(A)..	191570	20 5.5	+20 37	6.3	F1	.09	3.1	.023
5174.....	191753	20 6.4	−12 41	6.4	G9	.03	0.3	.006
C 2634.....	191785	20 6.6	+15 53	7.3	K2	.58	5.7	.048
ADS 13461A....	191854	20 6.9	+43 39	7.5†	G4	.10	4.6	.026
5176.....	191862	20 6.9	−12 55	5.9	F6	.27	3.4	.032
5177.....	192004	20 7.6	+26 31	5.8	K4	.02	−0.6	.005
5179.....	192107	20 8.1	− 1 19	5.6	K5	.03	−0.1	.007
BD +15°4089.....	192145	20 8.2	+15 47	7.6	F4	0.02	3.5	.015
BD +16°4192.....	.....	20 9.1	+16 16	8.4	G2	.....	0.7	.003
5180.....	192310	20 9.1	−27 20	5.7	K5	1.25	6.4	.138
5183A....	192439	20 9.7	+51 10	6.4	K1	0.02	0.7	.007
BD +16°4200.....	.....	20 9.8	+16 27	9.8	G8	.....	0.9	.002
5184.....	192455	20 9.9	+61 47	5.7	F5	.16	3.0	.029
5187(A)..	192577	20 10.5	+46 26	4.6†	cK1‡	.00	−1.8	.005
ADS 13560A....	192679	20 11.0	+52 49	7.0	F5	.18	3.2	.017
ADS 13560B....	.....	20 11.0	+52 49	9.1	K2	.18	6.0	.024
5192.....	192713	20 11.2	+23 12	5.7†	cG4	.02	−2.3	.003
5193A....	192787	20 11.5	+33 26	5.8	G6	.13	1.5	.013
5194.....	192781	20 11.6	+60 20	6.2	K5	.07	0.2	.006
5195.....	192806	20 11.6	+27 30	4.7	K2	.04	0.2	.013
5196.....	192836	20 11.9	+21 17	6.2	K1	.03	0.5	.007
BD +31°4013.....	.....	20 12.0	+32 2	9.1	F7	.....	3.1	.006
5197A....	192876	20 12.1	−12 49	4.6	cG5	.02	−2.7	.003
5198.....	192879	20 12.1	−22 7	6.0	G8	.05	0.6	.008
BD +27°3668.....	192913	20 12.3	+27 29	6.7	A2sp*	.02	0.7	.006
5200A....	192909	20 12.4	+47 24	4.5†	cK5	.01	−2.5	.004
5201.....	192944	20 12.5	+24 22	5.4	G7	.03	0.6	.011
5202A....	192947	20 12.5	−12 51	4.1†	G8	.06	0.3	.017
BD −14°5708.....	193102	20 13.4	−14 36	7.4	Ko	.....	0.7	.005
5206A....	193150	20 13.6	−19 26	5.5	K4	.01	−0.5	.006
C 2648.....	193202	20 13.8	+76 55	8.8	Mo	.51	8.9	.105
5213.....	193370	20 14.8	+34 40	5.5†	cF5	.02	−1.3	.004
5216(A)..	193495	20 15.4	−15 6	3.5†	F8‡	.04	2.0	.050
BD +74° 854.....	193591	20 15.9	+75 6	8.5	M4	.04	0.1	.002
5218A....	193592	20 15.9	+55 5	6.0†	A7s	.02	2.3	.018
5218B....	.....	20 15.9	+55 5	7.7†	F3	.02	3.2	.013
5219.....	193664	20 16.5	+66 32	6.1	G1	0.56	4.6	.050
C 2654.....	193901	20 17.7	−21 40	8.2	F5	1.18	3.9	.014
5226.....	194013	20 18.2	+ 5 1	5.4	G7	0.05	0.5	.010
5229A....	194093	20 18.6	+39 56	2.3	cF7	0.00	−2.1	0.013

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
5230.....	194152	20h18m8	+45°28′	6.2†	G9	0″.05	0.0	0″.006
BD +38°4048.....	229152	20 19.0	+38 9	9.8	K3	.....	6.4	.021
5231.....	194193	20 19.2	+40 42	6.1	Mo	.05	−0.6	.005
5232.....	194215	20 19.3	−28 59	6.0	G9	.01	0.6	.008
5234.....	194258	20 19.7	+68 34	6.0	M5	.04	−0.1	.006
5235.....	194317	20 19.9	+31 52	4.6	K5	.04	0.7	.017
5237A....	194433	20 20.4	−37 44	6.4†	K1	.28	2.5	.017
5238.....	194577	20 21.3	+21 5	5.8	G6	.02	0.8	.010
C 2657.....	194640	20 21.5	−31 11	6.7	G6	.55	5.1	.048
5242A....	194765	20 22.3	− 2 26	6.6	F6	.10	3.5	.024
5244A....	194943	20 23.2	−18 9	5.0	F1	.03	2.7	.035
5246.....	194959	20 23.3	−17 46	6.8	F8	.04	2.4	.013
5247(D)..	194960	20 23.3	−18 12	6.7	G8	.14	0.6	.006
5248.....	195006	20 23.7	−22 43	6.2	M1	.03	−0.3	.005
5251.....	195068	20 24.0	+49 3	5.7	Fo	.09	2.5	.023
5254.....	195135	20 24.4	− 3 13	5.1	K2	.07	0.7	.013
BD +75° 739.....	195191	20 24.8	+75 43	8.0	K2	.....	0.2	.003
5255.....	195295	20 25.3	+30 2	4.1	cF4	.01	−0.9	.010
5256.....	195330	20 25.5	−15 23	6.2	G5	.07	1.0	.009
C 2662.....	195506	20 26.7	+45 35	6.6	K3	.17	0.5	.006
5261.....	195527	20 26.8	+68 26	7.2	G5	.03	1.2	.006
5263A....	195564	20 26.9	−10 12	5.8	G3	.32	4.4	.052
5267A....	195593	20 27.2	+36 36	6.3	cF5	.01	−1.2	.003
5271(A)..	195774	20 28.2	+48 53	5.6	M2	.04	0.2	.008
5276.....	195964	20 29.3	+56 26	6.3	K5	.02	0.0	.005
C 2667.....	195987	20 29.3	+41 33	7.0	G9	.48	5.4	.048
5279.....	196093	20 30.0	+34 54	4.8	cK4	.02	−2.6	.003
βGC 10335A....	196124	20 30.2	+ 5 47	8.7	K6	.44	6.8	.042
5280.....	196142	20 30.4	+72 12	6.4	K4	.02	0.0	.005
ADS 14054A....	196310	20 31.4	−13 5	7.6	F1	.05	3.3	.014
5284.....	196321	20 31.5	− 2 54	5.2	K5	.01	−0.4	.008
5285.....	196348	20 31.7	−15 30	6.9	K2	.08	0.3	.005
5291A....	196524	20 32.8	+14 15	4.5†	F3	.11	2.6	.042
5293.....	196565	20 33.2	+81 6	6.9	G9	.04	0.6	.005
5294A....	196574	20 33.2	− 1 27	4.8†	G5	.03	0.5	.014
5296.....	196629	20 33.5	+31 10	6.4	A5n	.07	1.9	.013
BD + 5°4570.....	196657	20 33.7	+ 5 18	9.0	F4	.....	2.8	.006
5299.....	196725	20 34.0	+12 58	6.1	cK4	.02	−1.3	.003
C 2672.....	196761	20 34.2	−24 8	6.3	G7	.66	5.0	.055
5304A....	196755	20 34.3	+ 9 44	5.2	G2	.32	3.8	.052
5305A....	196758	20 34.3	+ 0 8	5.4	G9	.09	0.4	.010
C 2673.....	196789	20 34.4	+42 29	7.1	F6	.20	3.2	.017
5306.....	196777	20 34.4	−18 29	5.3	M2	.04	−0.5	.007
5308.....	196787	20 34.5	+81 5	5.6	G8	.03	0.6	.010
C 2676A*...	196795	20 34.6	+ 4 37	8.2	K6†	0.84	7.9	0.087

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
5309.....	196852	20^h34^m9	+29°59′	5.9	G9	0″.09	0.7	0″.009
ADS 14123A....	196882	20 35.1	+21 22	8.5	K4	.04	0.8	.003
C 2680.....	196892	20 35.1	−19 8	8.2	F4	.44	3.8	.013
5312.....	196925	20 35.3	+80 44	6.1	G8	.23	2.4	.018
ADS 14152A....	197042	20 35.9	− 1 26	8.7	K1	.03	−0.3	.002
BD +14°4389.....	197040	20 36.0	+14 10	7.7	A2n	.....	2.2	.008
C 2682.....	197076	20 36.2	+19 34	6.4	G2	.34	4.9	.050
5317.....	197121	20 36.6	+14 14	6.2	K4	.01	0.0	.006
5319A....	197177	20 37.0	+31 57	6.0†	G7	.02	0.4	.008
BD +19°4489.....	197274	20 37.6	+19 30	7.5	G8	.01	0.4	.004
5321.....	197373	20 38.2	+60 9	6.0	F4	.19	3.4	.030
VW Cephei*.....	197433	20 38.7	+75 14	8.3†	G4p	.63	4.9	.021
20C 1225.....	197481	20 38.9	−31 42	8.1	M2e	.45	8.0	.096
C 2688.....	197623	20 39.8	− 0 4	7.7†	G1	.15	4.1	.019
ADS 14233A....	197684	20 40.2	+11 57	6.9†	A7n	.....	2.2	.011
5328.....	197692	20 40.2	−25 38	4.6†	F1	.17	3.5	.060
5330.....	197752	20 40.5	+24 55	5.4†	K2	.18	0.5	.010
BD +31°4210.....	197839	20 41.1	+31 25	8.0	K1	.02	0.4	.003
20C 1228.....	.....	20 41.5	+44 8	9.5	M3	.50	9.4	.096
5331A....	197912	20 41.5	+30 21	4.3	G7	.03	0.7	.019
ADS 14270A....	197913	20 41.6	+15 32	7.5†	G9	.15	5.4	.038
ADS 14270B....	.....	20 41.6	+15 32	8.2	G8	.14	5.4	.027
5334(B)..	197963	20 42.0	+15 46	5.5	F5	.21	2.9	.030
5335(A)..	197964	20 42.0	+15 46	4.5	K1	.21	0.7	.017
5336A....	197989	20 42.2	+33 36	2.9†	K0	.48	0.7	.036
5337.....	198001	20 42.3	− 9 52	3.8	A1n	.04	2.3	.050
5338.....	198026	20 42.5	− 5 24	4.6	M3	.04	−0.2	.011
5341(B)..	.....	20 42.7	−18 34	8.5	G4	.03	1.8	.005
5342(A)..	198063	20 42.8	−18 34	6.7	G4	.02	1.7	.010
5344.....	198084	20 42.9	+57 13	4.6	F9	.24	3.0	.048
5345A....	198134	20 43.2	+34 0	5.2	K3	.05	0.3	.010
5346A....	198149	20 43.3	+61 27	3.6	G7	.83	2.6	.063
ADS 14278A....	198180	20 43.5	+63 11	8.5	A6n	.....	1.9	.005
5351.....	198208	20 43.7	−18 24	6.4	K4	.04	0.2	.006
ADS 14298A....	198237	20 43.9	+45 13	6.7	M0	.03	0.1	.005
ADS 14314A....	198287–8	20 44.2	+38 55	7.0	cA7se	.03	−1.8	.002
5355A....	198345	20 44.5	+47 28	5.6	K5	.02	0.2	.008
5358A....	198390	20 44.9	+12 10	6.0	F4	.11	3.5	.032
5360.....	198431	20 45.2	−12 55	6.0	K1	.14	0.9	.010
BD +38°4240.....	198456	20 45.4	+38 55	7.9	K0	.03	0.4	.003
5363.....	198542	20 45.8	−27 18	4.2	M1	.02	−0.5	.011
5364A....	198571	20 46.1	− 6 0	6.3†	F3	.09	3.1	.023
ADS 14355A....	198626	20 46.4	+30 32	6.8	F2	.06	2.4	.013
5368A....	198732	20 47.2	−24 9	6.2	G5	.11	2.6	.019
5371.....	198743	20 47.3	− 9 22	4.8	A8s	0.05	2.2	0.030

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
5372	198802	20^h47^m6	−11°57′	6.4	G1	0″.07	3.8	0″.030
5373	198809	20 47.8	+26 43	4.8	G2	.10	0.9	.017
ADS 14382A	198896	20 48.4	+43 23	8.5	G7	.05	3.3	.009
ADS 14382B	.....	20 48.4	+43 23	8.8	A7s	.....	2.0	.004
5374	199012	20 49.1	−18 18	5.9	Ko	.06	1.0	.010
5376	199098	20 49.8	+44 48	5.6	G8	.02	−0.1	.007
5378	199101	20 49.8	+33 3	5.7	K5	.04	−0.1	.007
5379	199169	20 50.3	+27 41	5.2	K5	.01	0.0	.009
5380	199178	20 50.4	+44 0	7.6	G5p*	.02	4.2	.021
5381	199191	20 50.4	+54 8	7.2	G6	.18	4.0	.023
5382A	199223	20 50.7	+ 4 9	6.2†	G6	.06	2.3	.017
5385	199253	20 50.9	+13 20	5.4	Ko	.02	−0.1	.008
C 2707	199305	20 51.3	+61 48	8.6	M2	.77	8.9	.115
5386A	199345	20 51.5	−10 5	5.7	K5	.02	0.3	.008
5388	199437	20 52.1	+80 11	5.6	K1	.04	0.8	.011
C 2709	199476	20 52.4	+74 23	7.9	G3	.69	4.5	.021
C 2712	199580	20 53.1	+42 30	7.9	G9	.28	4.3	.019
BD +48° 3249	199612	20 53.2	+48 49	6.0	Ko	.00	0.3	.007
ADS 14441A	199660	20 53.6	+69 34	7.8	G6	.02	1.0	.004
5395	199665	20 53.6	+10 27	5.6	G6	.08	1.0	.012
5397	199697	20 53.8	+21 56	5.6	K4	.00	0.3	.009
5399AB	199766	20 54.1	+ 3 55	5.8†	Fo	.19	2.9	.026
5399C	.....	20 54.1	+ 3 55	7.2	F4	.22	3.8	.021
5401	199870	20 54.7	+44 5	5.8	G7	.13	0.8	.010
5406	199960	20 55.3	− 5 7	6.3	G1	.14	4.0	.035
ADS 14528A	199976	20 55.4	− 8 44	8.2	G7	.24	4.4	.017
5407	200004	20 55.6	−13 55	6.6	G3	.00	2.3	.014
5409A	200044	20 55.9	+18 56	6.0	M3	.08	0.2	.007
CD −34°14810	200072	20 56.0	−34 26	8.7	F8	.....	3.0	.007
C 2718	200077	20 56.1	+39 52	6.6	F8	.31	3.8	.027
20C 1250A*	.....	20 56.2	+39 41	10.2†	M3e	.67	9.9	.087
5412	200205	20 57.0	+59 3	6.1†	K3	.05	0.5	.008
5413A	200256	20 57.3	+ 6 47	7.4†	F3	.02	2.9	.013
5416A	200465	20 58.5	+39 7	6.5	K3	.01	−0.2	.005
BD +31° 4320	200510	20 58.8	+31 57	7.2	K2	.01	−0.4	.003
5418A	200497	20 58.8	− 6 13	6.2†	G4	.02	0.7	.008
C 2727A*	200560	20 59.1	+45 29	7.8	K3	.41	6.1	.046
C 2728	200580	20 59.1	+ 2 36	8.1	F6	.48	3.7	.013
5420	200577	20 59.2	+38 16	6.2	G8	.01	0.2	.006
ADS 14597A	200631	20 59.5	+30 41	7.8	Ko	.05	0.8	.004
5422	200644	20 59.6	+ 5 6	5.9	K5	.02	−0.6	.005
5425A	200723	21 0.1	+41 14	6.6†	Fo	.05	2.4	.014
C 2732	200779	21 0.4	+ 6 41	8.9	K6	.55	7.4	.050
5428	200790	21 0.5	+ 5 34	6.0	F7	.17	3.1	.026
5430A	200914	21 1.3	−25 24	4.6	M1	0.06	−0.1	0.011

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
5431	200905	21h 1m3	+43°32′	4.2†	cK5	0″.01	−2.0	0″.006
ADS 14638A	200968	21 1.6	−14 19	7.2	K1	0.37	5.9	.055
5433(A)	201091	21 2.4	+38 15	5.6	K6	5.20	7.7	.263
5434(B)	201092	21 2.4	+38 15	6.3	Mo	5.20	8.6	.288
5436A	201251	21 3.2	+47 15	4.9	K5	0.01	−1.4	.005
5438	201352	21 3.8	−20 57	6.2	F1	.18	3.3	.026
5441	201381	21 4.1	−11 47	4.5	G8	.09	0.5	.016
βGC 10775A	201479	21 4.8	+16 57	9.6	F4	.06	2.8	.004
BD +32°4069	201505	21 4.9	+32 22	8.1	G7	.02	0.8	.003
BD +38°4362	201561	21 5.2	+38 19	7.8	K1	.06	0.3	.003
5443A	201601	21 5.5	+ 9 44	4.8	cF1	.17	−0.2	.010
5445	201647	21 5.8	−40 40	5.8	F5	.22	3.4	.033
ADS 14708A	201672	21 5.9	+19 33	8.1†	F2	.04	3.1	.010
ADS 14708B	.....	21 5.9	+19 33	8.5	F2	.04	3.0	.008
BD +15°4362	201751	21 6.5	+15 27	8.7	K4	.03	0.5	.002
5446	201772	21 6.7	−39 50	5.3	F4	.23	2.6	.029
ADS 14736B	.....	21 6.8	−15 24	8.0†	F9	.....	3.9	.015
C 2749	201891	21 7.4	+17 21	7.3	F4	.92	4.2	.024
5448	201901	21 7.4	−28 2	5.6	K5	.17	0.1	.008
ADS 14738A	201889	21 7.5	+23 45	8.2†	F9	.46	3.9	.014
5452	202109	21 8.7	+29 49	3.7†	G4	.06	−0.6	.014
C 2753	202123	21 8.8	+73 18	8.8	K4	.52	6.8	.040
5455AB	202275	21 9.6	+ 9 36	5.3†	F3	.32	4.0	.055
5456	202320	21 9.9	−21 4	5.4	Ko	.01	0.2	.009
5457	202369	21 10.2	−15 35	5.5	M3	.02	−0.1	.008
5458	202380	21 10.2	+59 41	7.1	M2	.01	−1.9	.002
5459A	202403	21 10.5	+40 44	7.8†	G5	.04	2.3	.008
5460A	202444	21 10.8	+37 37	4.1†	Fo	.46	2.7	.052
5461	202447	21 10.8	+ 4 50	4.4†	F6	.10	2.6	.044
5462	202466	21 10.9	− 9 38	6.8	M4	0.01	−0.4	.004
C 2757	202560	21 11.4	−39 15	6.6	M1	3.51	8.5	.240
C 2763	202751	21 12.9	− 0 15	8.5	K6	0.47	6.8	.046
5470	202890	21 13.7	−16 36	6.9	G7	.03	1.0	.007
BD +17°4546	202907	21 13.8	+17 18	7.6	K1	.02	0.7	.004
BD +17°4548	202926	21 13.9	+17 34	7.2	F3	.02	3.2	.016
ADS 14847A	202940	21 14.0	−26 46	6.6†	G4	.66	5.1	.050
5472	202987	21 14.2	+55 23	6.2	K4	.02	−0.2	.005
C 2770	203040	21 14.6	−20 15	9.2	K6	.76	7.9	.055
5476	203222	21 15.8	− 4 59	6.0	G7	.03	0.8	.009
5479	203291	21 16.1	+ 6 56	6.0	M2	.04	−0.3	.005
5480A	203280	21 16.2	+62 10	2.6	A3n	.16	2.0	.076
5482	203344	21 16.6	+23 26	5.8	G8	.25	0.8	.010
5483	203364	21 16.6	− 9 45	6.9	K3	.05	0.4	.005
5484	203387	21 16.7	−17 16	4.3	G6	.03	0.9	.021
5485A	203380	21 16.8	+52 33	6.9	F6	0.07	3.6	0.022

CATALOGUE—*Continued*

	Star	HD	α 1900	δ 1900	Vis. m	Sp.	μ	Vis. M	Spec. π
	5485B	.....	21^h16^m8	+52°33′	6.9	G5	0″.07	4.2	0″.029
	5486	203399	21 16.8	+76 35	6.2	K5	.02	0.0	.006
	5487	203475	21 17.3	−23 6	5.7	M1	.04	−0.5	.006
	5489A	203504	21 17.5	+19 23	4.2	Ko	.12	0.6	.019
	5489B	.....	21 17.5	+19 23	9.2	K5	.12	6.5	.029
	5490	203525	21 17.6	− 9 45	6.2	Mo	.05	0.0	.006
	5491A	203562	21 17.9	+ 6 23	5.6†	A3s	.05	1.6	.016
BD	+15°4404	203631	21 18.4	+16 4	7.6	K5	.02	−0.1	.003
	5494	203638	21 18.5	−21 17	5.5	K2	.13	0.5	.010
	5495	203644	21 18.5	+48 58	6.2†	Ko	.07	0.6	.008
BD	+41°4115	.....	21 18.6	+41 26	9.1	K4	.01	0.0	.001
	5498A	203803	21 19.5	+23 51	5.7	Fo	.12	2.0	.018
	5499	203836	21 19.6	+86 37	7.4	A4n	.03	2.1	.009
	5500	203843	21 19.6	− 3 50	6.4	A9n	.05	1.6	.011
	5503	203926	21 20.1	− 3 59	5.7	K4	.08	0.2	.008
	5504	203925	21 20.1	+25 45	5.7	F2	.04	1.9	.017
	5507A	204075	21 21.0	−22 51	4.2†	cG4	.02	−1.3	.008
C	2783	204121	21 21.4	+ 0 41	6.4	F5	.19	3.2	.023
	5508A	204129	21 21.5	+79 55	7.8†	F4	.18	3.3	.013
	5509	204149	21 21.6	+83 50	7.1	Ko	.02	0.7	.005
	5510	204139	21 21.6	−21 38	6.0	K5	.04	−0.2	.006
	5511	204153	21 21.7	+46 17	5.5	A7n	.21	1.9	.019
	5513	204381	21 23.0	−22 15	4.6	G5	.13	0.7	.017
	5519	204485	21 23.9	+31 47	5.7	F2	0.13	3.5	.036
C	2790	204587	21 24.5	−12 56	9.4	Mo	1.05	8.2	.057
	5521	204692	21 25.2	−14 44	6.8	K2	0.04	0.6	.006
C	2794	204712	21 25.3	+11 50	7.7	F5	.18	3.8	.017
	5522A	204724	21 25.4	+23 12	4.8	M1	.02	0.1	.011
	5523	204771	21 25.8	+46 6	5.3	Ko	.11	0.9	.013
C	2797	204814	21 26.0	+45 27	7.9	G9	.55	5.1	.027
	5527A	204867	21 26.3	− 6 1	3.1	cG1	.02	−2.5	.008
BD	+45°3566	204933	21 26.8	+46 6	8.3	A8s	.....	2.0	.005
	5532B	.....	21 27.4	+70 7	7.8	A4n	.01	2.0	.007
	5533	205072	21 27.8	+80 5	6.1	G6	.05	0.9	.009
BD	+51°3079	205114–5	21 28.1	+52 11	6.8†	cG2p‡	.02	−1.5	.002
ADS	15076A	205160	21 28.4	+20 16	7.6†	F4	.04	3.6	.016
ADS	15076B	.....	21 28.4	+20 16	8.3	F7	.04	3.7	.012
	5536	205234	21 28.9	+75 58	8.2†	A6n‖	.03	1.7	.005
	5537	205289	21 29.2	−20 32	5.8	F1	.04	3.3	.032
	5538	205306	21 29.3	−20 42	7.0	F4	.06	3.0	.016
	5540	205342	21 29.5	−23 54	6.4	G7	.08	0.6	.007
BD	+67°1324	.....	21 30.0	+67 56	8.7	K2	.03	0.5	.002
	5542	205423	21 30.1	− 4 26	5.8	G9	.02	0.3	.008
	5543	205435	21 30.2	+45 9	4.2	G5	.10	0.6	.019
	5546	205512	21 30.7	+38 5	5.0	G7	0.15	0.5	0.013

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
BD +26°4213	.....	21^h32^m2	+26°14′	9.3	K5	0″.04	0.8	0″.002
5550A	205765	21 32.4	− 0 50	6.3	A1n	.03	2.0	.014
5550B	.....	21 32.4	− 0 50	9.2	F6	.03	3.5	.007
C 2808	205855	21 33.0	− 2 45	8.8	K6	.53	7.2	.048
5555	205852	21 33.1	+18 52	6.0†	A5n‖	.10	2.0	.016
5556A	205924	21 33.5	+ 5 19	6.1†	A2n	.12	2.3	.017
BD +32°4216	205967	21 33.8	+32 41	7.6	G5	.04	0.2	.003
5558	206043	21 34.4	+19 49	5.8	A5n	.12	2.0	.017
5559A	206058	21 34.4	− 0 30	7.3†	F7	.24	3.8	.020
5560	206067	21 34.5	+ 1 48	5.3	K0	.09	0.8	.013
5561	206078	21 34.5	+61 51	7.7	G6	.14	0.7	.004
5562	206088	21 34.5	−17 7	4.1†	F2*	.19	1.8	.035
BD +30°4496	206137	21 35.1	+31 5	8.1	F5	.05	3.0	.010
5566	206301	21 36.1	−14 30	5.6†	G1	.33	3.9	.046
5567A	206330	21 36.3	+42 49	5.4	M1	.05	0.3	.010
5568A	206356	21 36.3	−23 43	5.3	G9	.13	0.7	.012
C 2816	206374	21 36.6	+26 18	7.4	G3	.36	4.8	.030
BD − 0°4249	206404	21 36.8	− 0 6	7.7	F6	.07	3.1	.012
5569	206445	21 37.1	+ 0 50	5.8	K4	.02	−0.5	.005
5570	206453	21 37.1	−19 19	4.8	G4	.14	1.0	.017
5571A	206482	21 37.3	+57 8	7.1	F4	.05	2.5	.012
5572	206487	21 37.3	+ 5 13	5.6	M2	.02	−0.3	.007
5575	206546	21 37.6	−20 5	6.5†	A6n	.08	1.4	.010
BD − 0°4257	206660	21 38.5	+ 0 5	7.1	G8	.07	0.6	.005
5583	206749	21 39.1	+40 42	5.5	M2	.03	−0.3	.007
5584A	206778	21 39.3	+ 9 25	2.5	cK0	.02	−2.3	.011
5587(A)	206826	21 39.7	+28 17	4.7	F6	.37	3.3	.052
5588(B)	206827	21 39.7	+28 17	6.1	F3	.32	3.8	.035
C 2823	.....	21 39.7	+24 53	9.5	G8	.66	5.1	.013
5589	206834	21 39.7	− 9 33	5.6†	G7	.01	0.0	.008
5590	206859	21 39.8	+16 53	4.5	cG3	.03	−1.3	.007
5592A	206901	21 40.1	+25 11	5.1†	F2	.03	3.0	.038
5592C	.....	21 40.1	+25 11	10.0	G9	.....	1.2	.002
5593A	206936	21 40.4	+58 19	4.4	M2	.00	−3.0	.003
5594	206952	21 40.5	+70 51	4.8	K1	.15	0.4	.013
5595	207005	21 40.9	− 9 44	6.2	M3	.02	−0.4	.005
5597	207061	21 41.3	−12 9	7.0	F5	.13	3.0	.016
5599	207089	21 41.5	+22 29	5.4	cK1	.02	−2.8	.002
5600A	207098	21 41.5	−16 35	3.3†	A7s	.39	1.8	.050
5602	207134	21 41.8	+25 6	6.5	K2	.15	0.7	.007
5603	207130	21 41.8	+71 52	5.4	K1	.06	0.8	.012
C 2833	207491	21 44.1	+ 5 15	8.6	K6	.54	7.1	.050
5612	207489	21 44.2	+38 29	7.2	cG0	.01	−1.4	.002
5613	207503	21 44.3	−13 11	6.4†	A8s	.01	1.7	.011
5614	207528	21 44.5	+60 14	5.6	M1	0.01	0.6	0.010

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
5616.....	207652	21h45m4	+16°49′	5.3	A8n	0″.10	2.4	0″.026
ADS 15377C....	207804	21 46.5	+32 12	8.5	K1	.03	0.3	.002
5620A....	207826	21 46.8	+66 20	6.8†	F2	.07	2.2	.012
ADS 15392A....	207862	21 47.0	+ 8 37	7.9	A9s	.....	1.9	.006
BD +64°1596.....	207884	21 47.2	+64 46	7.9	M3	.01	−1.0	.002
BD +31°4562.....	207908	21 47.3	+31 27	7.5	K4	.03	0.3	.004
5622.....	207920	21 47.5	− 4 28	6.7	G5	.02	0.8	.007
5623.....	207958	21 47.8	−14 1	5.2	F0	.31	2.9	.035
5625.....	207978	21 48.0	+28 20	5.6	F0	.10	3.2	.033
ADS 15398A....	208074	21 48.7	+66 22	8.7†	F4	.01	3.6	.010
5631.....	208111	21 49.0	− 4 45	5.9	K2	.10	0.8	.010
ADS 15407A....	208132	21 49.1	+65 17	7.0†	A8s	.02	1.2	.007
ADS 15407B....	208133	21 49.1	+65 17	7.2	F0	.02	2.2	.010
5632.....	208219	21 49.7	+55 44	6.9	G6	.03	0.4	.005
20C 1321.....	.....	21 50.8	+32 10	10.8	G2	.73	4.3	.005
5638.....	208502	21 51.4	+53 28	6.9	F5	.17	3.6	.022
ADS 15475A....	208552	21 51.9	+15 39	8.3	F5	.04	3.5	.011
ADS 15475B....	.....	21 51.9	+15 39	9.8	G5	.04	5.2	.012
5645.....	208735	21 53.2	−21 40	6.2	M4	.02	−0.4	.005
5647.....	208742	21 53.3	+79 5	6.8	M2	.03	−0.4	.004
C 2857.....	208776	21 53.4	+ 3 18	7.1	F6	.31	3.8	.022
VV Cephei*.....	208816	21 53.8	+63 9	5.7†	M2e	.01	−2.1	.003
5651.....	208906	21 54.3	+29 21	6.8	F6	0.54	3.8	.025
5654*....	209100	21 55.7	−57 12	4.7	K5	4.69	6.8	.263
5655.....	209128	21 56.0	+ 0 7	5.8	K4	0.01	0.2	.008
5657.....	209167	21 56.2	+ 7 47	5.8	K5	.02	0.1	.007
5658A....	209166	21 56.2	+12 38	5.7	F2	.08	2.2	.020
BD +30°4587.....	209206	21 56.5	+30 15	8.7	A8n	.....	2.3	.005
5659.....	209240	21 56.7	−18 23	6.4	G7	.12	0.5	.007
5661.....	209369	21 57.8	+72 42	5.2	F3	.17	2.9	.035
5671.....	209625	21 59.6	− 1 23	5.5†	A8s	.04	1.8	.018
5673.....	209761	22 0.6	+26 11	5.9	K3	.05	0.8	.010
5674.....	209747	22 0.6	+ 4 34	4.9	K5	.14	0.6	.014
5676.....	209750	22 0.6	− 0 48	3.2	cG1	.02	−2.2	.008
5677(B)..	209791	22 0.9	+64 8	6.5	F7	.23	3.6	.026
5678.....	209772	22 0.9	+62 38	5.5	M5	.05	0.0	.008
5682(A)..	209942	22 1.8	+82 23	7.1	F5	.14	3.7	.021
5683(B)..	209943	22 1.9	+82 23	7.9†	G5	.14	4.8	.024
5685.....	209960	22 2.0	+62 18	5.4	K5	.06	0.5	.010
5686.....	209945	22 2.0	+44 32	5.3	Mo	.02	0.2	.010
BD +29°4585.....	209964	22 2.0	+30 5	8.7	F3	.01	3.2	.008
5688.....	210027	22 2.4	+24 51	4.3†	F3	.30	3.6	.072
BD +29°4586.....	210060	22 2.6	+29 49	7.4	K2	.05	0.5	.004
5691.....	210074	22 2.7	+18 59	5.8	F2	.13	2.8	.025
C 2885.....	210144	22 3.1	+52 39	7.9	Ko	0.62	5.4	0.032

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
5694	210220	22h 3m8	+58°21′	6.3	G4	0″.03	0.6	0″.007
5697	210277	22 4.2	− 8 2	6.6	G9	.46	5.1	.050
5698	210302	22 4.3	−33 2	5.1	F5	.45	3.3	.044
5700	210353	22 4.7	+47 27	7.1†	A1s	.04	1.0	.006
5701A	210354	22 4.8	+32 41	5.6	G6	.09	1.0	.012
5707	210434	22 5.3	− 4 46	6.1	K0	.06	0.6	.008
5708	210464	22 5.5	−21 43	6.1	F6	.11	2.9	.023
5709	210459	22 5.5	+32 41	4.4	A7n	.03	1.1	.022
C 2889	.....	22 5.9	+22 18	9.4†	K4	.58	6.5	.026
5711	210702	22 7.0	+15 33	6.1	G7	.02	0.9	.009
5712	210705	22 7.0	−14 41	6.2	F1	.05	3.2	.025
5714	210745	22 7.4	+57 42	3.6	cK5	.01	−2.3	.007
5715	210763	22 7.5	− 5 13	6.4	F4	.07	3.0	.021
5716	210807	22 7.9	+71 51	5.0	G3	.03	0.6	.013
5721	210855	22 8.2	+56 21	5.4	F6	.27	3.0	.033
5723A	210884	22 8.4	+69 38	5.5	F3	.06	2.8	.029
5724	210889	22 8.4	+34 7	5.4	K2	.05	0.6	.011
5725	210918	22 8.5	−41 51	6.4	G1	.95	4.7	.046
5727	210939	22 8.7	+60 16	5.5	G9	.03	0.6	.010
5730	211006	22 9.1	+28 7	6.0	K3	.04	0.5	.008
5731A	211076	22 9.5	+16 42	6.6	K5	.13	0.5	.006
5732A	211073	22 9.6	+39 13	4.9†	K4	.05	0.2	.011
5741A	211300	22 11.1	+72 49	6.1	G7	.03	0.1	.006
BD +15°4604	211341	22 11.3	+15 31	8.2	F4	.01	2.5	.007
5742	211336	22 11.4	+56 33	4.2	A6n	.45	1.8	.033
ADS 15791A	.....	22 11.4	+30 55	8.9	F3	.06	3.1	.007
ADS 15791B	.....	22 11.4	+30 55	10.4	F6	.06	3.6	.004
5743	211361	22 11.4	−13 20	5.6	K0	.02	0.5	.010
5744	211391	22 11.6	− 8 17	4.3	G6	.11	0.6	.018
5745	211392	22 11.6	− 9 32	6.1	K3	.05	0.5	.008
5746	211388	22 11.6	+37 15	4.2	K4	.02	−0.6	.011
5749	211434	22 11.9	− 5 53	5.8	G4	.02	0.9	.010
C 2903	211476	22 12.3	+12 24	6.9	G2	.85	4.5	.033
5751	211554	22 12.8	+56 43	6.3†	G4	.04	0.1	.006
5752	211676	22 13.6	−13 48	6.1	G7	.07	0.5	.008
C 2908	.....	22 13.8	+67 50	9.1	K6	.37	7.9	.057
BD +14°4772	211800	22 14.6	+15 3	7.2	M1	.02	−0.3	.003
5756	211833	22 14.9	+62 18	6.0	K3	.05	0.3	.007
BD +15°4622	.....	22 15.0	+15 20	9.3	K3	0.01	2.1	.004
5758*	211998	22 16.0	−72 44	5.4	G0	1.45	3.9	.050
ADS 15851A	212005	22 16.1	+24 27	8.3	K0	0.06	0.4	.003
5759	212010	22 16.1	−22 6	5.4	K2	.09	0.2	.009
5767	212247	22 17.7	+43 14	8.0	K2	.03	0.8	.004
5768	212271	22 17.9	−25 16	5.6	G9	.09	0.8	.011
5769	212320	22 18.3	− 7 42	6.1	G6	0.01	0.3	0.007

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. m	Sp.	μ	Vis. M	Spec. π
5771A	212391	$22^h18^m.8$	+66°12′	6.7	G6	0″.04	0.6	0″.006
5771B	212392	22 18.8	+66 12	8.0†	A3s	.04	0.9	.004
5772A	212395	22 18.8	+20 21	6.2†	F4	.34	3.6	.030
5774	212430	22 19.1	−14 2	5.9	G6	.05	0.6	.009
5775	212474	22 19.4	− 1 42	7.1†	G6	.11	1.0	.006
5776	212496	22 19.6	+51 44	4.6	K0	.19	1.0	.019
5781(B)	212697	22 21.1	−17 15	6.6	G1	.26	4.8	.044
5782(A)	212698	22 21.1	−17 15	6.4	G2	.21	4.4	.040
5786A	212754	22 21.5	+ 3 53	5.8	F5	.30	3.5	.035
5787	212774	22 21.7	+85 43	6.8	K0	.05	0.7	.006
5788	212790	22 21.9	+53 18	7.4	K2	.01	0.5	.004
BD +53°2876	212810	22 22.0	+53 26	7.4	F1	.09	3.3	.015
5790	212943	22 22.8	+ 4 12	4.9	K0	.32	2.3	.030
BD +74° 964	212955	22 22.9	+74 20	8.0	G5	.02	0.8	.004
BD +69°1250	212976	22 23.1	+69 23	8.3†	G6	.02	0.6	.003
5792	213022	22 23.4	+70 16	5.7	K2	.04	0.3	.008
ADS 15967A	213014	22 23.4	+16 45	7.5	G8	.02	0.2	.003
ADS 15966A	213013	22 23.5	+23 1	8.3	G8	.....	5.4	.026
ADS 15966B	.....	22 23.5	+23 1	8.8	K2	.....	6.2	.030
C 2920	213042	22 23.6	−30 30	7.8	K6	.87	6.9	.066
5793(B)	213051	22 23.7	− 0 32	4.6	F1	.17	2.7	.042
5794(A)	213052	22 23.7	− 0 32	4.4	F2	.21	2.7	.046
5797	213119	22 24.1	+ 8 37	5.8	K5	.06	−0.4	.006
ADS 15972A	239960	22 24.4	+57 12	9.8	M3	.86	10.8	.158
5798	213179	22 24.5	+26 15	6.0	K2	.03	0.2	.007
5799	213198	22 24.7	−13 26	6.2	F1	.18	2.2	.016
5800A	213235	22 24.9	+ 3 55	5.7†	F2	.15	2.3	.021
5802	213296	22 25.3	−26 35	6.5	K1	.07	0.6	.007
5803	213320	22 25.4	−11 11	5.2†	A2s	.03	1.1	.015
5804	213310	22 25.4	+47 12	4.6	Mo	.02	−2.3	.004
BD +75° 832	213556	22 27.1	+75 43	7.9	K3	0.01	−0.2	.002
20C 1370AB*	.....	22 28.7	+53 16	10.7†	M1	1.58	8.6	.038
5816	213780	22 28.8	−10 7	6.8	K2	0.01	0.8	.006
5817	213789	22 28.9	− 2 5	5.9	G6	.04	0.7	.009
BD +52°3240	.....	22 29.0	+53 12	10.2	M5	.....	−0.4	.001
5819	213845	22 29.2	−21 13	5.3	F3	.26	3.0	.035
5820	213893	22 29.5	+ 0 5	7.0	Mo	.09	−0.3	.003
5821	213930	22 29.8	+56 6	5.8	G6	.09	0.8	.010
5822	213986	22 30.1	−24 30	6.0	K0	.02	0.5	.008
5825	214028	22 30.4	−17 59	6.8	K5	.06	0.2	.005
C 2937	214059	22 30.5	+ 4 52	8.4	G4	.45	4.4	.016
5830	214128	22 31.0	+19 46	6.7	K2	.12	0.5	.006
BD +60°2412	.....	22 31.4	+60 17	9.0	K5	.09	6.9	.038
BD +60°2414	214165	22 31.4	+60 19	7.1	F1	.13	3.0	.015
5835A	214376	22 32.6	− 4 45	5.3	K1	0.14	0.8	0.013

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
ADS 16121A	214422	$22^h32^m.9$	+26°55′	8.3†	G0	0″.05	3.8	0″.013
5838	214470	22 33.3	+73 7	5.2	F3	.17	1.3	.017
BD + 1°4637	214547	22 33.8	+ 2 0	10.3	F3	.52	3.2	.004
5839	214572	22 34.0	−10 33	7.2	G0	.04	3.7	.020
5840	214567	22 34.0	+19 0	5.8	G7	.11	0.6	.009
5841B	214615	22 34.2	−13 8	8.8†	G8	.28	4.4	.013
BD +68°1319	214605–6	22 34.3	+68 41	8.0†	F2*	.02	2.3	.007
ADS 16138AB	214608	22 34.4	+43 47	7.6†	G0	.24	4.6	.025
5843A	214665	22 34.7	+56 17	5.5	M4	.06	−0.4	.007
5846	214686	22 34.8	− 9 53	7.0†	F6	.17	3.6	.021
5851AB	214850	22 35.9	+14 1	5.8	G3	.30	4.2	.048
5852	214868	22 36.1	+43 45	4.6	K2	.10	−0.1	.011
5855	214966	22 36.8	−29 53	6.4	M5	.03	−0.3	.005
5857	214995	22 37.0	+14 0	6.1	K0	.10	0.4	.007
5859	215081	22 37.6	−22 11	7.3	G3	.05	0.8	.005
BD − 0°4406	215093	22 37.7	− 0 17	6.9	F2	.03	2.7	.014
C 2958	215110	22 37.8	− 0 6	8.0	G4	.22	4.0	.016
5861	215097	22 37.8	−10 38	7.2	K1	.01	0.5	.005
5864	215167	22 38.2	−19 21	4.9	K3	.04	0.1	.011
5865A	215182	22 38.3	+29 42	3.4†	G2	.04	0.6	.027
ADS 16220A	215324	22 39.1	+45 30	7.4	F5	.17	3.2	.014
5866	215318	22 39.2	+80 52	6.9	G0	.02	1.1	.007
5868A	215359	22 39.6	+38 56	6.2†	K5	.02	0.2	.006
5868B	.....	22 39.6	+38 56	8.4	K1	.02	0.9	.003
5869A	215373	22 39.7	+41 18	5.2	G7	.01	0.6	.012
ADS 16242A	.....	22 40.5	+10 40	9.7†	K6	.....	7.0	.029
5872	215510	22 40.6	+18 50	6.4	G6	.06	0.9	.008
ADS 16248A	215549	22 40.9	+29 56	6.5	K0	.46	4.8	.046
ADS 16254A	215578	22 41.1	+18 43	8.0	G8	.03	0.3	.003
5874A	215648	22 41.7	+11 40	4.3	F3	.54	3.8	.079
5875	215665	22 41.7	+23 2	4.1	G6	.06	0.3	.017
5878	215721	22 42.2	−20 8	5.4	G7	.24	1.0	.013
20C 1382	.....	22 42.5	+43 49	10.2	M5e	.84	11.2	.158
5881A	215812	22 42.7	− 4 45	7.3†	G3	.35	4.9	.033
5881B	.....	22 42.7	− 4 45	7.8	G3	.34	5.0	.027
5884	216032	22 44.3	−14 7	4.2	M0	.04	−0.3	.013
5885	216131	22 45.2	+24 4	3.7	G6	.15	0.9	.027
5887	216174	22 45.6	+55 22	5.6	K0	.09	0.5	.010
ADS 16291A	216172	22 45.6	+68 2	7.1†	F4	.13	3.0	.015
ADS 16291B	.....	22 45.6	+68 2	7.1	F5	.13	2.9	.014
5891	216228	22 46.1	+65 40	3.7	K1	.14	0.6	.024
5892	216259	22 46.4	+13 26	8.0	K4	.52	6.4	.048
C 2986	.....	22 47.3	+31 12	9.4	K6	.50	6.9	.032
5894	216385	22 47.3	+ 9 18	5.3	F5	.52	3.3	.040
5895	216386	22 47.4	− 8 7	3.8	M2	0.04	−0.2	0.016

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
5896A....	216380	22^h47^m5	+61°10′	6.1†	G3	0″.12	1.1	0″.010
5897A....	216397	22 47.5	+42 47	5.2	Mo	.10	0.1	.010
5899A....	216446	22 47.9	+82 37	5.0	K3	.06	0.1	.010
5900.....	216489	22 48.1	+16 19	6.0†	K1	.03	0.4	.008
SW Lacertae*.....	216598	22 49.1	+37 23	9.8†	F9‖	.08	4.0	.007
5903A....	216608	22 49.2	+44 13	5.8†	F1	.02	2.8	.025
5904.....	216627	22 49.3	−16 21	3.5	A3s	.05	1.1	.033
5905.....	216637	22 49.4	− 7 44	6.3	K3	.04	0.5	.007
5907.....	216640	22 49.5	−16 48	5.7	K4	.23	1.9	.017
5909A....	216718	22 50.0	− 5 31	5.9	G7	.02	0.8	.010
20C 1391.....	216777	22 50.6	− 8 21	8.9	G1	.57	4.7	.014
5914.....	216946	22 52.0	+49 12	5.1	cK3	.01	−2.4	.003
5915.....	216953	22 52.1	− 5 21	6.4	G6	.02	0.6	.007
5916A....	216956	22 52.1	−30 9	1.3	A2s	.36	1.4	.105
BD +79° 758.....	216991	22 52.4	+79 43	7.8	K3	.01	0.7	.004
5917.....	217014	22 52.6	+20 14	5.6	Go	.21	4.3	.055
5920A....	217166	22 53.5	+ 8 50	7.0†	G1	.42	4.1	.026
5923.....	217251	22 54.3	−13 36	6.3	K5	.01	−0.2	.005
5924A....	217264	22 54.3	+ 0 26	5.6	K1	.10	0.4	.009
5925.....	217303	22 54.7	−25 42	5.8	Ko	.08	0.3	.008
C 3001.....	217357	22 55.0	−23 4	7.6	M1	.90	8.7	.166
C 3002.....	.....	22 55.1	+68 29	8.4	Ko	.66	5.2	.023
5927.....	217382	22 55.2	+83 49	5.0	K5	.11	0.1	.010
5929.....	217428	22 55.5	− 0 21	6.4	G4	.04	0.4	.006
5931.....	217476	22 55.9	+56 25	5.5	cG3	.01	−3.2	.002
5932.....	217531	22 56.2	− 7 36	6.4	K5	.03	0.4	.006
C 3007.....	217580	22 56.7	− 4 23	7.6	K4	.48	6.1	.050
5934.....	217701	22 57.4	− 7 7	6.5	M2	.04	−0.1	.005
BD +56°2933.....	240174	22 58.3	+56 34	8.6	G4	.11	4.0	.012
BD +30°4867.....	217888	22 58.8	+30 32	8.1	A2s	.01	0.9	.004
5940A....	217906	22 58.9	+27 32	2.6	M2	0.23	−0.6	.023
C 3014.....	217987	22 59.4	−36 26	7.4	M2	6.91	9.5	.263
5942.....	218031	22 59.7	+49 31	4.9	G8	0.23	0.8	.015
5943.....	218029	22 59.7	+66 40	5.5	K3	.03	0.1	.008
BD +30°4869.....	218043	22 59.8	+30 45	6.8	F2	.07	3.1	.018
BD +29°4855.....	218199	23 1.0	+30 11	8.3	G6	.01	1.0	.003
C 3019.....	218209	23 1.2	+65 52	7.5	G3	.61	4.8	.029
5950A....	218240	23 1.3	−24 17	4.8	G9	.07	0.8	.016
BD +30°4875.....	218300	23 1.8	+30 29	8.4	Ko	.02	0.6	.003
BD +29°4858.....	218301	23 1.8	+30 5	8.0	A5n	.03	1.9	.006
5952.....	218329	23 2.0	+ 8 52	4.7	M2	.02	0.7	.016
5954.....	218356	23 2.2	+24 56	5.0	cKo	.04	−1.6	.005
C 3023.....	218347	23 2.2	+15 44	9.3	F6	.17	3.4	.007
5957A....	218452	23 3.1	+45 51	5.6	K5	.03	0.2	.008
BD +29°4863.....	218454	23 3.1	+29 54	7.4	K4	0.02	0.3	.004

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
5958	218470	23h 3m2	+48°45′	5.8	F3	0″.19	3.1	0″.029
5959	218527	23 3.6	+ 1 35	5.6	G4	.18	2.4	.023
C 3028	218566	23 4.0	− 2 48	8.3	K5	.64	6.4	.042
5960	218594	23 4.1	−21 43	3.8	K1	.06	0.2	.019
5962A	218634	23 4.5	+ 8 8	5.4	M4	.00	−1.1	.005
5963	218640	23 4.6	−23 0	5.3†	G2‡	.01	0.6	.011
5966A	218658	23 4.7	+74 51	5.0†	G1	.03	0.5	.013
ADS 16557A	218739	23 5.3	+47 25	6.6	G0	.13	4.8	.044
5969A	218753	23 5.5	+58 47	5.6	A9s	.02	2.3	.022
5971	218792	23 5.7	+17 3	5.9	K4	.03	0.1	.007
5972	218804	23 5.8	+43 0	5.8	F3	.28	3.4	.033
5974	218935	23 7.0	+26 18	6.4	K0	.23	2.2	.014
5975	219080	23 8.0	+48 52	4.9†	F2	.13	2.7	.036
ADS 16599A	219127	23 8.3	+39 27	7.4	A8n	0.09	2.2	.009
5976	219134	23 8.5	+56 37	5.6	K5	2.10	6.6	.158
5977A	219175	23 8.8	− 9 28	8.3	F5	0.54	3.8	.013
5977B	.....	23 8.9	− 9 28	9.7†	G2	.54	4.4	.009
5978	219215	23 9.1	− 6 35	4.4	M2	.19	0.5	.017
5981BC	219430	23 10.6	− 9 38	9.8†	K6	.37	6.8	.025
5981A	219449	23 10.7	− 9 38	4.5	K0	.37	0.7	.017
5982	219477	23 10.9	+27 42	6.5	G3	.02	−0.2	.005
5986	219576	23 11.7	− 8 16	5.1	M5	0.02	−0.1	.009
ADS 16644AB	219617	23 11.9	−14 22	9.0†	A8sp*	1.30	5.0	.016
5988	219615	23 12.0	+ 2 44	3.8	G4	0.75	1.2	.030
5989	219623	23 12.1	+52 40	5.6	F7	.27	3.7	.042
BD −14°6441	219702	23 12.8	−14 20	6.8	K2	.....	0.2	.005
5993A	219734	23 13.1	+48 28	5.0	M2	.04	−0.1	.010
5996	219815	23 13.6	+41 14	6.2†	A9s	.01	2.0	.014
ADS 16665A	219829	23 13.8	+ 4 52	8.6	K1	.49	5.8	.027
5998A	219834	23 13.9	−14 0	5.6†	G4	.31	3.6	.040
5998B	.....	23 13.9	−14 0	7.6	K3	.28	6.2	.052
5999A	219877	23 14.2	− 5 40	6.0†	F0	.19	3.0	.025
6000A	219916	23 14.5	+67 34	5.0†	G7	.06	0.7	.014
6001	219945	23 14.8	+48 5	5.4	K0	.06	0.8	.012
6002A	219962	23 15.0	+47 50	6.4	K1	.21	0.4	.006
C 3054	219953	23 15.0	+28 19	8.8	K3	.66	5.9	.026
6003	219981	23 15.1	+41 32	6.0	M0	.04	0.1	.007
6004A	220009	23 15.2	+ 4 50	5.2	K0	.10	0.4	.011
BD +14°4974	220078	23 15.8	+14 31	7.6	A6n	.04	1.7	.007
6006	220088	23 15.9	+29 52	5.8	M0	.10	0.4	.008
BD +59°2701	220102	23 16.0	+59 44	6.7	cF3	.03	−0.3	.004
6008	220117	23 16.1	+37 38	5.8	F5	.14	3.1	.029
ADS 16693A	220149	23 16.4	+34 53	9.1†	G8	.02	0.6	.002
ADS 16693B	.....	23 16.4	+34 53	9.1	K2	.....	0.9	.002
C 3059	220182	23 16.8	+43 33	7.6	K1	0.67	5.8	0.044

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
6012A....	220321	23h17m7	−20°39′	4.2	K0	0″.15	0.7	0″.020
6013A....	220334	23 17.8	+20 1	6.6	G0	.32	4.4	.036
6013B....	.....	23 17.8	+20 1	9.6	K6	.32	7.4	.036
6014.....	220339	23 17.8	−11 19	8.1	K1	.50	5.2	.026
6015AB..	220363	23 18.0	+11 46	5.3	K4	.03	0.1	.009
6016.....	220369	23 18.1	+59 35	5.9	K5	.00	−0.7	.005
6017A....	220436	23 18.6	− 9 1	7.2†	K1	.02	0.5	.005
6019A....	220466	23 18.8	−22 19	6.5	F2	.10	3.2	.022
6020.....	220460	23 18.9	+31 59	6.5	F3	.23	3.2	.022
BD +76° 915.....	220636	23 20.3	+76 58	7.9	F6	.01	3.8	.015
6024.....	220657	23 20.4	+22 51	4.6	F6	.19	2.8	.044
6025A....	220652	23 20.4	+61 44	5.2	M2	.01	−1.2	.005
6026.....	220704	23 20.8	−21 11	4.5	K5	.08	0.0	.013
BD +52°3440.....	220719	23 21.0	+52 26	6.9	M4	.05	−0.1	.004
6028A....	220766	23 21.3	−22 17	6.6	K0	.04	0.3	.005
C 3074.....	220821	23 21.8	+44 47	7.4	F9	.47	4.4	.025
6031A....	220825	23 21.8	+ 0 42	4.9	A3s	.02	0.8	.015
6033.....	220858	23 22.1	+ 0 34	6.4	G7	.06	0.6	.007
BD +43°4462.....	220910	23 22.6	+43 19	8.0	K5	.02	−0.2	.002
BD +32°4649.....	220951	23 22.9	+32 26	7.4	A6n	.....	1.9	.008
6037.....	220954	23 22.9	+ 5 50	4.4	K0	.14	0.5	.017
6040.....	221115	23 24.1	+12 13	4.7	G9	.06	0.5	.014
6041.....	221147	23 24.3	− 2 21	6.6	K1	.03	0.2	.005
6042.....	221148	23 24.4	− 5 5	6.4	K3	.28	2.0	.013
6043.....	221146	23 24.4	− 1 35	7.1	G0	.03	4.1	.025
ADS 16800AB..	221264	23 25.5	+30 17	8.4†	F5	.00	3.3	.010
BD +43°4475.....	221303	23 25.8	+43 25	8.1	G9	.01	0.5	.003
6048.....	221356	23 26.4	− 4 38	6.5	F8	.25	3.6	.026
6049.....	221345	23 26.4	+38 41	5.3	G8	0.29	0.6	.011
C 3081.....	221354	23 26.5	+58 37	6.8	K2	1.06	5.6	.057
6050.....	221357	23 26.5	−21 55	6.2	A7n	0.00	1.2	.010
6051.....	221409	23 26.8	− 1 38	6.5	K1	.02	0.5	.006
BD +59°2740.....	221438	23 27.1	+59 59	9.2	A4s	.07	1.7	.003
C 3085.....	221585	23 28.2	+62 36	7.4	G3	.42	4.4	.025
6058.....	221615	23 28.5	+21 57	5.5	M5	.04	−0.2	.007
βGC 12434B....	221639	23 28.7	+59 52	7.3	G0	.09	2.4	.010
βGC 12434A....	221670	23 29.0	+59 54	7.7†	G6	.04	0.7	.004
6059AB..	221673	23 29.0	+30 46	5.2	K4	.05	0.2	.010
BD +73°1042.....	221697	23 29.3	+73 40	8.0	G8	.01	0.3	.003
6061.....	221758	23 29.7	+32 57	5.7	K0	.03	0.7	.010
C 3093.....	221830	23 30.4	+30 27	6.7	G0	.59	4.4	.035
6064.....	221833	23 30.4	+ 0 46	6.6	K2	.05	0.5	.006
C 3096.....	221914	23 31.0	+17 53	8.0	G5	.73	4.9	.024
6067.....	221950	23 31.3	+ 1 33	5.6	F0	.12	3.2	.033
6071.....	222107	23 32.7	+45 55	4.3†	G7	0.45	2.3	0.040

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. m	Sp.	μ	Vis. M	Spec. π
6077	222368	23^h34^m8	+ 5° 5′	4.3	F5	0″.57	3.5	0″.069
6078	222404	23 35.2	+77 4	3.4	K1	.17	2.1	.055
BD +74°1033	222448	23 35.6	+75 12	7.2	F3	.01	2.4	.011
ADS 16919A	222455	23 35.6	− 0 8	7.7	K4	.12	0.3	.003
6081	222493	23 36.0	−12 14	6.1	G9	.06	0.5	.008
6082	222547	23 36.4	−18 35	5.6	K5	.08	−0.1	.007
6083A	222574	23 36.6	−18 22	5.3†	cG1	.02	−1.9	.004
BD +74°1034	222598	23 36.9	+75 2	8.0	G9	.03	0.5	.003
6085	222643	23 37.3	−16 0	5.4	K5	.02	0.6	.011
6086	222641	23 37.3	+44 26	6.7	K5	.02	0.0	.005
6088	222683	23 37.7	+15 47	6.5	G7	.08	0.7	.007
6089	222764	23 38.3	+ 9 47	5.4	M2	.01	−0.2	.008
20C 1446	222766	23 38.3	− 8 29	9.7	G4	.59	4.4	.009
C 3115	222794	23 38.5	+57 31	7.0	G1	.61	4.0	.025
6094A	222842	23 39.0	+28 48	5.4†	G7	.08	0.5	.010
BD − 0°4561	222860	23 39.2	+ 0 10	8.0	F8	.07	3.3	.011
BD −15°6487	222870	23 39.3	−14 59	8.0	F2	.....	2.9	.010
6097	222932	23 39.9	+55 15	6.6	G4	.03	0.8	.007
C 3117	222935	23 40.0	+29 0	8.9	K2	.91	5.7	.023
6100A	223029	23 40.9	− 0 18	8.3†	F3	.04	3.2	.010
6101	223047	23 41.1	+45 52	5.1	cG5	.02	−1.6	.005
BD − 0°4566	223096	23 41.5	− 0 1	7.4	G7	.05	0.9	.005
6104	223170	23 42.1	−12 28	5.9	K1	.10	0.5	.008
6105	223173	23 42.1	+56 54	5.8	K3	.02	−1.1	.004
6106	223165	23 42.2	+58 6	5.1	G9	.09	0.7	.013
C 3121	223238	23 42.7	+ 3 37	8.2	G2	.48	4.0	.014
6107A	223252	23 42.8	− 3 19	5.6	G8	.09	0.5	.010
6109	223311	23 43.4	− 6 56	6.3	K4	0.03	−0.5	.004
C 3124	.....	23 44.0	+ 1 52	9.1	M2	1.39	9.2	.105
C 3126	223498	23 44.9	+ 2 19	8.4	G7	0.49	4.9	.020
6117A	223552	23 45.4	+51 4	6.5	A9s	.12	2.5	.016
6118	223559	23 45.4	−14 57	5.9	K5	.03	0.4	.008
6121	223637	23 46.2	+ 8 46	6.1	M3	.06	−0.5	.005
ADS 17054A	223718	23 46.8	+37 20	7.8†	F5	.11	3.4	.013
ADS 17054B	.....	23 46.8	+37 20	7.8	F5	.11	3.2	.012
6123	223719	23 46.8	+ 2 22	5.8	K5	.02	0.1	.007
6124	223731	23 47.2	+77 3	6.5	F3	.29	3.2	.022
6125	223755	23 47.3	+21 7	6.3	M2	.06	0.4	.007
6126	223774	23 47.4	−14 48	6.0	K3	.10	0.5	.008
6127	223768	23 47.4	+18 34	5.2	M3	.05	−0.2	.008
6129A	223778	23 47.5	+74 59	6.9†	K5	.33	6.5	.083
6130	223792	23 47.6	+21 11	6.8	G6	.03	0.8	.006
6131	223807	23 47.7	− 9 33	6.0	G9	.04	0.5	.008
6132	223825	23 47.8	− 3 43	6.1	G9	0.08	0.5	.008
BD −19°6533	223932	23 48.6	−18 56	7.4	G5	.....	4.4	0.025

CATALOGUE—*Continued*

Star	HD	α 1900	δ 1900	Vis. *m*	Sp.	μ	Vis. *M*	Spec. π
6135	224014	$23^h49^m.4$	+56°57′	4.8	cGo	0″.01	−3.0	0″.003
6136	224022	23 49.4	−40 51	6.0	F8	.36	3.3	.029
6137	224062	23 49.7	− 0 27	6.0	M5	.06	−0.5	.005
C 3131	224085	23 49.9	+28 5	7.6†	G8p*	.57	5.2	.033
6141	224152	23 50.5	+52 11	6.8	K3	.07	0.4	.005
6143	224225	23 51.0	−22 33	7.4	M3	.05	0.0	.003
ADS 17107A	224253	23 51.3	−10 3	9.0†	G3	.28	4.5	.013
BD +73°1066	224272	23 51.4	+73 35	8.2	Ko	.02	1.1	.004
6145	224342	23 52.0	+42 6	6.0	F3	.01	2.9	.024
6148	224355	23 52.1	+55 9	6.4†	F3||	.02	3.1	.022
6150	224427	23 52.7	+24 35	4.8	M3	.06	−0.3	.010
U Pegasi*	.....	23 52.9	+15 24	10.1†	G3||	.....	3.8	.005
6151	224465	23 53.0	+49 53	6.8	G2	.24	4.6	.036
C 3143	.....	23 53.5	+46 10	9.5	Mo	.64	8.7	.069
6153A	224533	23 53.6	− 4 7	5.1	G6	.09	0.5	.012
BD +26°4721	224615	23 54.2	+26 43	8.3	K4	.02	−0.2	.002
6156	224617	23 54.2	+ 6 19	4.3†	F3	0.19	2.3	.040
20C 1467	224618	23 54.2	−17 30	9.0	G6	1.19	4.8	.014
C 3146	224619	23 54.3	−20 35	7.4	G3	0.61	4.6	.027
6158A	224635	23 54.4	+33 10	7.3†	Go	.11	4.3	.025
6158B	224636	23 54.4	+33 10	7.3	G1	.11	4.4	.026
6159	224661	23 54.5	− 6 27	6.8	G7	.06	1.0	.007
6162A	224758	23 55.3	+26 22	6.4	F5	.06	3.2	.023
ADS 17178	224873	23 56.3	+39 5	9.2†	K1	.06	5.9	.022
BD +75° 904	224917	23 56.7	+75 37	9.0	K3	.02	0.6	.002
6171	224935	23 56.8	− 6 34	4.7	M3	0.05	−0.7	.008
6172A	224930	23 56.9	+26 33	5.9	G1	1.29	4.7	.057
6174	224995	23 57.3	+ 8 24	6.3	A4n	0.00	1.8	.013
6175	225003	23 57.4	+ 7 56	5.8	Aos	.10	2.6	.023
6176(A)	225009	23 57.5	+65 33	6.0	G5	.02	0.6	.008
6181	225197	23 59.2	−17 5	5.8	K2	.05	0.2	.008
6182	225212	23 59.4	−11 4	5.5†	cK5	.01	−2.7	.002
6184	225216	23 59.5	+66 37	5.8	K1	0.10	0.4	.008
C 3161	225213	23 59.5	−37 51	8.3	M3	6.11	10.0	.219
C 3162	225239	23 59.7	+34 6	6.2	F7	0.76	4.0	.036
ADS 41A	225291	23 59.8	+45 7	8.0†	F6	.03	3.5	.013
ADS 41B	.....	23 59.8	+45 7	9.0	G5	.03	4.8	.014
ADS 48F	.....	23 59.9	+45 14	9.9	M2	.89	10.0	.105
6188	6	23 59.9	− 1 4	6.3	G9	0.06	0.5	0.007

NOTES

HD 151 Emission lines of hydrogen. $H\beta$ stronger than $H\gamma$.

BD +61°8 $H\beta$ has emission borders.

HD 1760 Hydrogen lines bright on some plates. Variable. Mag. 5.2–6.0. Period 156 days.

HD 10783	λ 4128 and λ 4131 strong.
HD 12211	Eclipsing variable. Mag. 8.8–10.9.
HD 14330	Variable. Mag. 10.1–10.5.
HD 14469	Irregular variable. Mag. 7.4–8.4.
HD 14488	Irregular variable. Mag. 8.1–9.4.
HD 14580	Variable. Mag. 10.6–11.4.
HD 14595	Hydrogen strong.
HD 15089	λ 4077 and λ 4215 strong.
HD 19058	Irregular variable. Mag. 3.3–4.1.
HD 19445	White dwarf.
XY Persei	Eclipsing variable. Mag. 10.5–11.0.
HD 25007	Spectrum strongly veiled by early-type star which may be the visual companion
HD 25878	Hydrogen lines bright. Strong enhanced lines.
HD 26842	ADS states that the system has no appreciable proper motion.
HD 31964	ϵ Aurigae. Eclipsing variable. Mag. 3.0–4.1.
HD 40312	λ 4128 and λ 4131 strong.
HD 42474	Irregular variable of W Cephei type. Mag. 7.4–7.9.
HD 42995	η Geminorum. Variable. Mag. 3.2–4.2. Period 235 days.
HD 59693	U Monocerotis. Variable. Mag. 5.6–7.3. Period 92 days. RV Tauri type.
HD 60265	Eclipsing variable. Mag. 8.5–8.9.
HD 60414	Spectrum like that of W Cephei.
HD 62044	Strong emission lines of calcium H and K.
HD 68351	λ 4128 and λ 4131 strong.
HD 72522	Schlesinger states that the proper motion is very small.
HD 72968	λ 4077 and λ 4215 strong.
HD 73174	Hydrogen strong.
HD 73730	Hydrogen strong.
HD 74521	λ 4128 and λ 4131 strong.
HD 78209	Hydrogen strong.
HD 84937	White dwarf.
HD 96616	λ 4077 and λ 4215 strong.
HD 107612	λ 4077 and λ 4215 strong.
HD 116713	Barium II. λ 4555 strong.
HD 120198	λλ 4077, 4128, 4131 strong.
20C 825	White dwarf.
HD 128620–1	Estimates from plates loaned by the Lick Observatory.
HD 130559	λλ 4030, 4077, 4215 strong.
Boss 3779B	λλ 4030, 4077, 4215 strong.
HD 132475	White dwarf.
HD 137949	λ 4077 and λ 4215 strong.
HD 139815	Eclipsing variable. Mag. 9.3–10.0.
HD 140283	White dwarf.
HD 151199	λ 4077 strong.
HD 152107	λ 4077 strong.
TT Herculis	Eclipsing variable. Mag. 8.9–9.6.
HD 152751	Found double by Kuiper 1934. 134°.6, 0″.20, $\Delta m = 0.2$ mag.
HD 156947	Irregular variable. Mag. 6.3–7.0.
HD 158116	λ 4077 strong.

HD 159532 Lines fuzzy.
HD 161912 λλ 4173, 4178, 4233 strong.
HD 165945 λ 4077 and λ 4215 strong.
HD 166126 Eclipsing variable. Mag. 8.9–10.0. At minimum light, emission lines of *Fe* II and [*Fe* II] appear.
HD 170397 λλ 4077, 4128, 4131 strong.
HD 171586 λ 4077 and λ 4215 strong.
HD 172088 ADS states that the proper motion is negligibly small.
RZ Ophiuchi Eclipsing variable. Mag. 9.8–10.6. Period 262 days.
HD 175865 Irregular variable. Mag. 4.0–4.5.
HD 176232 λ 4077 and λ 4215 strong.
HD 184360 λ 4077 strong.
HD 188041 λ 4077 and λ 4215 strong.
HD 192913 λλ 4077, 4128, 4131 strong.
HD 196795 Found double by Kuiper. 312°.5, 0″.66, $\Delta m = 1.0$ mag.
HD 197433 Variable of W Urs. Maj. type. The lines are probably double.
HD 199178 Lines fuzzy.
20C 1250A Found double by Kuiper, 1934. 82°.5, 0″.93, $\Delta m = 1.6$ mag.
HD 200560 Found double by Kuiper, 1934. 104°.0, 2″.84, $B = 13.0$ mag.
HD 206088 λ 4077 strong.
HD 208816 Irregular variable of W Cephei type. Mag. 4.9–5.7.
HD 209100 From plates loaned by the Lick Observatory.
HD 211998 From plates loaned by the Lick Observatory.
20C 1370 Found double by Kuiper, 1934. 225°.8, 0″.55, $\Delta m = 0.0$ mag.
HD 214605 Hydrogen strong.
HD 216598 Eclipsing variable. Mag. 9.0–9.8. Period 0.3 days.
HD 219617 White dwarf.
HD 224085 Calcium H and K are bright.
U Pegasi Eclipsing variable. Mag. 9.3–9.9. Period 0.37 days.

CARNEGIE INSTITUTION OF WASHINGTON
MOUNT WILSON OBSERVATORY
November 1934

PHOTO-ELECTRIC OBSERVATIONS OF ζ AURIGAE

By C. M. HUFFER

ABSTRACT

The 1934 minimum of ζ Aurigae was observed with the photo-electric equipment of the Washburn Observatory. Despite the star's low altitude and some unfavorable weather, enough measures were secured to indicate that the partial eclipse lasted about 1.0 day and the total phase 36 days. Color measures confirm the spectroscopic results that the large star is of class K5. To produce a decrease of $0^{M}50$ when the K5 star eclipses a small hot star, it is necessary to assume a temperature of about 12,000° for the smaller star if the eclipse is central ($i=90°$). In this case the ratio of radii $k=0.027$. If the eclipse is non-central, k must be decreased and a higher temperature for the smaller star is permitted.

The variable star ζ Aurigae was observed with the photo-electric photometer of the Washburn Observatory on thirteen nights during or near the recent minimum of 1934. The photometer consists of a Kunz potassium photo-electric cell in corex glass and the vacuum-tube amplifier in nearly the form described by A. E. Whitford.[1]

Because of the low altitude of the star during the hours of darkness, no observations were attempted before August 16, astronomical reckoning. Beginning just before dawn on that date, observations were made on every clear night until after the beginning of the eclipse. Clouds and daylight or the low altitude of the star prevented long-continued observations during the critical times, but we did catch the star just at the end of the first partial phase on August 24, and again midway on the up-curve on September 30.

Two comparison stars, η and 2 Aurigae, were used at first, but η was suspected to be slightly variable and is still under observation; hence the measures of the present paper depend only upon 2 Aurigae, which is assumed to be constant in light. A neutral shade was used on ζ to reduce it by 0.72 mag. The differences of magnitude ζ (shade 0.72) >2 are shown in Table I. These observations are plotted in Figure 1. The curve has been drawn symmetrically about the middle of the eclipse and through the observations of August 24 and September 30.

From the curve it appears that there was a slight diminution of

[1] *Ap. J.*, **76**, 213, 1932.

brightness before the rapid decrease to minimum began. Similarly, there was a slight rise after the rapid increase to maximum. This

TABLE I

OBSERVATIONS OF ζ AURIGAE

J.D. 242+	ζ>2	Residual	Observer	J.D. 242+	ζ>2	Residual	Observer
7666.876...	+0M420	0M000	H	7697.794...	−0M080	−0M001	H
7669.864...	+ .399	− .021	H	7708.757...	− .087	− .008	H
.881...	+ .424	+ .004	.....	.769...	− .088	− .009	.....
7671.862...	+ .396	− .011	H	7711.776...	+ .115	.....	S
.879...	+ .404	− .003	.....	.926...	+ .187	.....	.....
7674.860...	− .062	.....	H	7712.726...	+ .392	+ .007	S
.873...	− .037	.....	.....	.788...	+ .392	+ .007	.....
.883...	− .050	.....	.....	7713.740...	+ .404	+ .007	S
7678.792...	− .071	+ .008	H	.775...	+ .399	+ .002	.....
.805...	− .064	+ .015	.....	7717.778...	+ .429	+ .009	H
7692.852...	− .089	− .010	H	.791...	+ .430	+ .010	.....
.869...	− .082	− .003	.....	7720.744...	+0.419	−0.001	S
7697.784...	−0.068	+0.011	H				

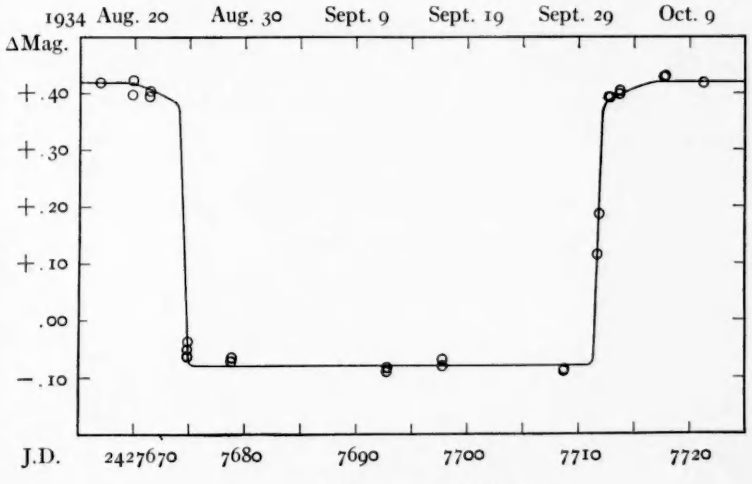

FIG. 1.—The light-curve of ζ Aurigae

suggests that the large star has an extensive and extremely rare atmosphere which transmits nearly all the light of the small body. The time of passage of the B star behind this atmosphere is three or

four days. The remarkable changes in the spectrum occurring at this time will no doubt be reported from other observatories.

Because of the scanty data available, it is impossible to state accurately the times of the four contacts. However, from the rate of increase between the two observations on J.D. 2427711 it seems that the duration of the partial phase is not far from 1.0 day, neglecting the change of brightness due to the rare atmosphere of the larger star which slightly dims the smaller star at the beginning and ending of the eclipse.

The total loss of light is 0.50 magnitude at wave-length approximately 4500 A, at which the potassium photo-electric cell is most sensitive. The average deviation of a single observation is ± 0.007 mag.

Assuming the spectroscopic period, we have the following elements from the curve as drawn:

$$\text{Minimum} = \text{J.D. } 2427693.1 + 973 \cdot E$$

The next eclipse should begin about April 22, 1937, and end May 31, 1937, but at that season of the year the star will be unobservable. We shall be forced to wait until December 21, 1939, to January 29, 1940, for the next eclipse at a favorable season.

The color of ζ was measured on five nights and compared with the color of 2 Aurigae, spectral class K2, and the results are given in Table II. The color index is in magnitudes as determined by the

TABLE II

PHOTO-ELECTRIC COLOR INDICES

J.D. 242+	ζ	Class	2
7708.79.....	$+0^{M}.97$	K5	$+0^{M}.78$
7711.89.....	.74	K1	.....
7712.82.....	.56	G4	.78
7717.72.....	.54	G4	.79
7732.73.....	+0.56	G4	+0.74

relative transmission through yellow and blue filters, the same filters which have been used in our color determinations since 1930.[2] Since

[2] *Pub. Washburn Obs.*, **15**, Part V, 1934. In this publication the color index of ζ Aurigae = H.D. 32069 is in error; the star actually measured was η Aurigae = H.D. 32630.

the cell used in 1934 has a slightly different color sensitivity from the one previously used, the scales are not quite the same. It appears that the larger component of ζ Aurigae has the color of a K5 star, while the addition of the blue star gives a combined light equivalent to G4.

In spite of the insufficiency of the data and the difficulty of deciding on the times of the four contacts, it is interesting to compute rough elements for the system. Assuming the inclination $i=90°$, the duration of the partial phase 1.0 day, and the duration of totality 36.4 days, we have for the ratio of the radii

$$\frac{r_2}{r_1}=k=\frac{1.0}{1.0+36.4}=0.027\ .$$

If we assume the absolute temperature of the K5 body to be 3400°, we find on using Planck's formula that the temperature of the smaller body should be about 12,000° in order to have an eclipse of 0.5 mag. Table III gives the resulting decrease of brightness for wave-lengths 4260, 4500, 4770, and 5290 A. The last two columns give the value of k and the duration of the partial phase which would be necessary to make the photo-electric eclipse 0.5 mag.

TABLE III

	Range in Magnitude for $k=0.027$				k and Partial Phase for Range $0^M.50$ at 4500 A	
T of Smaller Body	4260 A	4500 A	4770 A	Visual 5290 A	k	Duration
20,000° = B1	$1^M.57$	$1^M.23$	$0^M.96$	$0^M.59$	0.014	$0^d.53$
15,000 = B5	1.08	0.82	.62	.37	.019	0.70
12,000 = B9	0.71	0.53	.40	.24	.026	0.96
Observed	0.77	0.50	0.36	(0.2)	0.027	1.0

It seems from the data at hand that a duration of the partial phase of about one-half day is impossible, and that with a central eclipse the smaller body cannot be of color-temperature as high as 20,000°, but is probably at about 12,000°, corresponding to a spectral class between B5 and A0. The more the inclination differs from 90°,

the greater is the difference in the radii and the higher the temperature and surface brightness of the smaller body which will satisfy the observations.

Since no orbit of the B component has been published, we can only guess at the relative masses of the two bodies. The most likely ratio of the masses seems to be between $m_1 = 2m_2$ and $m_1 = 3m_2$. Table IV gives the results of this assumption, using the spectroscopic mass function from Harper,[3] $f(m_1, m_2) = 1.03$.

TABLE IV

Sun = 1		$m_1 = 2m_2$	$m_1 = 3m_2$
$k = r_2/r_1$		0.027	0.027
Radii	r_1	153.	204.
	r_2	4.0	5.3
Masses	m_1	18.5	49.4
	m_2	9.3	16.5
Densities	d_1	5.1×10^{-6}	5.9×10^{-6}
	d_2	0.15	0.11

I am indebted to Professor Joel Stebbins for a part of the observations, and to Mr. E. J. Bernet, who was in charge of the operation of the amplifier and assisted at the telescope. The amplifier has been rebuilt in part through the aid of a grant from the Rumford Fund of the American Academy of Arts and Sciences.

WASHBURN OBSERVATORY
MADISON, WIS.
December 20, 1934

[3] *Pub. Dom. Ap. Obs.*, **3**, 156, 1924.

NOTE ADDED FEBRUARY 18, 1935

A letter from the Mount Wilson Observatory today informs me that by combining observations from Madison, Cambridge, Königsberg, and Mount Wilson it appears that the partial phase may be 1^d5 or more. The spectrograms taken at Mount Wilson show that the B star must be late B—almost Ao.

A DETERMINATION OF THE UPPER LIMIT OF INTERNAL MOTIONS IN THE PRAESEPE CLUSTER

By P. VAN DE KAMP

ABSTRACT

Proper motions with a probable error of 0".0008 are derived for 35 stars in the Praesepe cluster, from photographs at the McCormick Observatory having a time interval of 19.6 years. An upper limit of 0".00073 is found for the probable internal motion in each co-ordinate.

In a recent investigation[1] regarding the accuracy of photographic positions, the writer measured the positions of 52 stars in the central part of the Praesepe cluster on 20 plates, with the mean epoch 1934.16, taken with the McCormick 26-inch visual refractor. In the years 1914 and 1915, plates were taken, mainly by Dr. Mitchell, 11 of which are centered approximately like the recent plates. The average epoch of these plates is 1914.56. On account of the relatively large interval of 19.6 years and the large number of plates it was decided to measure also the early plates and thus derive proper motions.

As only a few of the measured stars are non-cluster stars, it was clear that no contribution could be made toward a knowledge of the group motion of the cluster. However, it was hoped that the small error expected might indicate the presence of internal motions of the cluster. In an extensive investigation Klein Wassink[2] has derived proper motions with an average probable error of 0".0016, using plates from various observatories; he finds his material inadequate for a derivation of internal motion. The present material gives motions with a higher accuracy shown by the probable error of 0".0008, an upper limit of 0".00073 being derived for the probable internal motion in each co-ordinate.

MATERIAL AND MEASURES

Table I contains information about the plates. It should be noted that the early plates had longer exposures, causing considerable dif-

[1] *Ap. J.*, **80**, 301, 1934.

[2] *Gron. Pub.*, **41**, 1927.

ferences in the intensities of the images of the brighter stars on early and recent plates. The whole series of plates is remarkably free from visible guiding errors.

TABLE I

LIST OF MEASURED PLATES

Plate	Date	Hour Angle	No. of Images	Exposure Time	Observer	Weight
B 10	1914 April 5	$+0^h11^m$	1	10^m	M	0.5
11		−0 19	1	30	M	.5
12		−0 54	1	30	M	.7
18	10	−0 39	1	30	M	.7
19		−1 14	1	15	M	.7
21		−2 7	1	30	M	.7
23	12	−0 22	1	30	M	.7
24		−1 3	1	30	M	.7
55	1915 Jan. 9	+0 50	1	120	M, A	.7
67	March 9	−1 32	1	120	G	0.7
69	19	+0 1	2	10, 20	G	1.0
B 438	1934 Feb. 6	−1 23	2	4	V	1.0
439		−1 35	2	4	V	1.0
440	10	+0 19	2	6	R	1.0
441		+0 3	2	6	R	1.0
442		−0 12	2	6	R	1.0
443		−0 26	2	6	R	1.0
444		−0 42	2	6	R	1.0
445		−0 57	2	6	R	1.0
446		−1 12	2	6	R	1.0
447		−1 27	2	6	R	1.0
448	March 12	+0 34	2	6	V	1.0
449		+0 16	2	6	V	1.0
450	15	+0 41	2	6	V	1.0
451		+0 25	2	6	V	1.0
452		+0 8	2	6	V	1.0
453		−0 8	2	6	V	1.0
454		−0 26	2	6	V	1.0
455		−0 43	2	6	V	1.0
456		−0 59	2	6	V	1.0
457		−1 15	2	6	V	1.0

M=S. A. Mitchell G=P. H. Graham R=D. Reuyl
A=H. L. Alden V=A. N. Vyssotsky

Slight relative shifts among the plates reduced the common measurable area to 15×9 cm. (on 5×7 in. plates), or about 50′ by 30′, an area of 0.4 sq. deg. The center of the measured area is very close to the center of the cluster, as given by Klein Wassink (R.A., $8^h34^m39^s$; decl., +20°1′0). Of the 52 stars measured on the recent plates, 40 were measured on the early plates, the remainder being omitted on

account of being shifted off the plates (8 stars), of being within 1 cm. of the edge (3 stars), or of being too faint on several plates (1 star). Thus the 40 stars measured on all plates furnish homogeneous proper-motion material.

The positions were measured on the Gaertner machine in two coordinates, X and Y, approximately in the directions of right ascension and declination. The plates were carefully set and oriented in the machine so as to have the corresponding readings for the same star in the same part of the screw for all plates, thus eliminating the systematic (progressive and periodic) errors of the machine. All measurements were repeated immediately with the plate reversed 180°, so as to eliminate personal errors. The last column in Table I gives the relative weights of the measured positions assigned during the measurements.

REDUCTION OF THE MEASURES

For the purpose of deriving the proper motions and their errors, four pairs of groups of plates were formed, due consideration being given to insure approximate equality of accuracy of the motions derived from the different pairs. Details are given in Table II.

TABLE II

GROUPS OF PLATES

Pair	Plates		Epoch	Interval
	Recent	Early		
I	B 439, 440, 442, 444, 446	B 10, 18, 19	1934.109–1914.269	19.84
II	B 438, 441, 443, 445, 447	B 11, 12, 24	1934.109–1914.266	19.84
III	B 449, 451, 453, 455, 457	B 21, 23, 67	1934.201–1914.580	19.62
IV	B 448, 450, 452, 454, 456	B 55, 69	1934.201–1915.120	19.08

In forming means for the early plates all images were given equal weight.

The differences Δx and Δy obtained for each star from each pair of plate-groups furnish the following equations of condition:

$$\Delta x = ax + by + c + d(m - \overline{m}) + m_x ,$$

$$\Delta y = a'x + b'y + c' + d'(m - \overline{m}) + m_y ,$$

where a, b, c, etc., are the plate constants, d and d' are the coefficients in a linear magnitude-error term, and m_x and m_y are the total proper motions (in mm) during the interval. Of the 40 stars, 4 are non-cluster stars, according to Klein Wassink (KW 340, 333, 407, and 443); one other (KW 258) has a motion differing 0".012 from the group motion of the cluster and has not been considered a member of the group.

A provisional set of 16 cluster stars (4 in each quadrant), chosen so as to eliminate the effects of magnitude error, gave preliminary values of a and b, a' and b'. Next c and c' were derived from the 35 cluster stars by making the sums of the corrected Δx and Δy equal to zero. These corrected values show a definite run with magnitude for all pairs, both in X and in Y.

TABLE III

MAGNITUDE ERROR PER MAGNITUDE EXPRESSED IN SECONDS OF ARC PER YEAR

Pair	X	Y
I	−".0019	−".0005
II	.0011	.0001
III	.0036	.0025
IV	−.0019	−.0015
Mean	−.0021	−.0011

Within the errors of the material, the observed magnitude effects vary linearly with the magnitudes—hence the introduction of a linear term in the equations. The magnitudes used were those of van den Bos.[3] (Plate 449 [two images] was measured with the Schilt microphotometer and showed a very close correlation between the van den Bos magnitudes and the McCormick galvanometer readings. For 4 stars the differences were large enough to make us apply small corrections to the van den Bos magnitudes [the corrections being $+0^m.3$ to the stars KW 279, 328, and 416; $-0^m.3$ to star 154].)

The resulting magnitude errors are given in Table III. The probable error of these is 0".00018 for the individual values and ".00009 for the mean. The present magnitude errors are quite different from

[3] *Bull. Astr. Neth.*, **1**, 79, 1922.

those obtained by Klein Wassink. The latter finds practically no magnitude error in the X co-ordinate, but in the Y co-ordinate his material indicates that the brighter stars move more rapidly to the

TABLE IV

RELATIVE MOTIONS OF 40 PRAESEPE STARS

Unit = 0".001

Klein Wassink No.	Vis. Mag.	μ_x				μ_y				Mean	
		I	II	III	IV	I	II	III	IV	μ_x	μ_y
124	8.6	− .7	+ 3.7	− 2.1	+ .9	+ 2.6	+ 3.2	− 1.5	+ 1.3	+ .4	+ 1.4
142	9.0	− 2.5	+ 1.7	− 3.4	− 3.7	+ 1.9	+ 1.4	− 1.3	+ .1	− 2.0	+ .5
150	7.4	− .3	− .5	+ 5.5	+ .1	− 4.2	+ 2.8	+ 2.7	+ 1.7	+ 1.2	+ .8
154	8.2	+ 1.5	− .4	+ 1.1	.0	− .7	− 5.6	+ 1.7	− 2.0	+ .6	− 1.6
155	9.3	+ 2.5	− 1.1	+ 1.2	− 3.5	+ 1.5	+ .7	− 2.2	− 1.2	− .2	− .3
181	10.3	− 3.3	− .3	− 8.9	− 2.2	− .8	+ 4.1	− 4.9	− 1.3	− 3.7	− .7
204	6.5	+ .4	− 3.6	+ 2.8	+ 1.8	+ 3.6	+ 5.2	− 2.4	+ 1.3	+ .4	+ 1.9
212	6.4	+ 1.1	− .2	+ 1.5	+ 2.6	− 4.3	− .3	− .1	+ 3.0	+ 1.2	− .4
224	7.2	− 6.4	− 1.6	− 8.5	− 2.8	− 3.2	− 1.3	+ 2.3	+ 2.5	− 4.8	.0
229	7.5	− 1.7	+ 2.4	− 1.6	+ 3.5	− 3.6	− 2.1	− 3.8	− .4	+ .6	− 2.5
238	10.0	− 1.4	− .7	+ .5	+ 1.1	− 2.4	+ 1.7	+ 2.6	+ 2.6	− .1	+ 1.1
250	9.6	+ .4	− .1	+ 1.8	− 2.0	+ 4.8	+ 2.6	+ .8	+ .8	+ .0	+ 2.2
268	9.6	.0	− 1.4	− 2.6	− 2.6	+ .9	− 4.0	− 2.5	+ 2.4	− 1.6	− .8
275	9.6	.0	+ 2.9	+ 2.3	+ 1.7	+ 2.7	− 1.0	+ 3.7	+ 1.9	+ 1.7	+ 1.8
276	7.4	− 2.6	− 1.1	− 1.4	− 1.3	+ 2.0	− 2.3	+ 3.9	+ .7	− 1.6	+ 1.1
279	7.7	− .1	− 1.9	+ 4.0	− 1.0	+ 1.9	− 3.4	− 2.4	+ 1.7	+ .2	− .6
283	6.2	− .1	− .9	− 4.9	− 1.7	+ 2.9	+ 3.1	+ .4	− 3.1	− 1.9	+ .8
286	7.8	− 2.3	+ .4	.0	.0	+ 1.8	− 2.6	+ .4	+ .5	− .5	+ .0
287	10.2	− 1.7	+ 5.0	− .9	+ 3.0	− 1.4	+ 2.2	+ 1.9	− 3.9	+ 1.4	− .3
288	10.4	+ .6	− 5.5	− 1.9	− .7	− 3.6	− .8	− 2.2	− 3.1	− 1.9	− 2.4
293	9.7	+ .5	− 3.4	.0	+ .4	+ 2.4	− .6	− 2.9	− .8	− .6	− .5
295	9.0	+ 1.8	+ 1.0	− .1	+ 1.6	+ 3.5	− .5	+ 4.2	+ 2.0	+ 1.1	+ 2.3
300	6.2	+ 3.8	+ 1.0	− .6	+ 3.9	− 3.6	− 4.8	+ 1.4	− 5.2	+ 2.0	− 3.0
322	10.6	+ 2.5	+ 4.2	+ 2.8	+ 2.8	− 1.6	− 3.1	+ 1.3	+ .8	+ 3.1	− .6
328	6.9	+ 2.9	+ 2.3	+ 1.9	− 1.6	− .9	+ 3.7	+ .9	+ 4.5	+ 1.4	+ 2.1
334	10.6	+ 4.2	− 1.9	+ .7	− 2.0	− 5.7	− 5.2	− .6	− 2.9	+ .2	− 3.6
341	10.3	− 1.9	− 1.4	+ 3.2	+ .9	+ 2.1	+ 2.5	− .4	+ 1.1	+ .2	+ 1.3
348	6.7	+ 1.9	− 1.4	+ 4.4	+ 1.6	+ .4	− 2.0	+ 1.8	+ 1.3	+ 1.6	+ .4
367	10.4	− 3.6	− 3.8	+ 1.5	+ 4.0	+ .2	− .4	+ 3.5	+ 4.4	− .5	+ 1.9
370	8.8	+ 2.7	− 1.7	+ .6	− 1.0	− 1.5	+ 2.1	− 1.5	− 2.6	+ .2	− .9
371	10.1	+ 1.8	+ .6	+ 3.7	+ 2.4	+ 1.1	+ 4.5	+ 2.7	+ 1.1	+ 2.1	+ 2.4
396	9.8	+ .1	+ 2.9	− 1.9	− 1.7	− 1.7	+ .4	.0	− 1.3	− .2	− .6
416	9.3	+ 1.2	+ 2.1	− .9	+ 1.4	+ .5	− 2.3	− 3.7	+ .4	+ 1.0	− 1.3
428	6.6	− .6	+ 3.7	− 2.6	− 1.9	− .7	− .9	− 4.6	− 2.7	− .4	− 2.2
445	7.8	− 2.0	− 1.4	+ 1.5	− 3.1	+ 1.6	+ 3.0	+ 1.7	− 5.0	− 1.2	+ .3
230	9.6	+38.0	+35.2	+36.2	+34.4	+16.7	+17.9	+13.8	+18.2	+36.0	+16.6
258	10.1	− 4.5	− 3.8	− 6.1	− 2.3	− 9.5	−11.0	−13.2	−12.5	− 4.2	−11.6
333	10.2	+35.0	+33.8	+28.0	+34.7	+14.0	+11.4	+11.1	+13.2	+32.9	+12.4
407	8.4	+22.9	+20.5	+22.8	+18.7	+ 5.0	+ 3.0	+ 1.7	+ 1.0	+21.2	+ 2.7
443	10.6	+32.5	+23.6	+32.5	+30.5	−27.0	−23.4	−22.1	−19.9	+29.8	−23.1

south than the fainter ones. In the present investigation, there is an appreciable magnitude error in X while in the Y co-ordinate the brighter stars move more rapidly to the north than the fainter ones. This comparison furnishes a strong argument toward the acceptance of the observed effects (whatever their source) as a systematic error and not as a cosmical phenomenon.

Correcting for magnitude error, preliminary values of m_x and m_y were obtained. Next a least-squares solution was made for corrections to a and b, a' and b', using the 29 cluster stars whose observed preliminary motions (mean of four pairs) were not over 0".003. The small corrections thus obtained were allowed for (maximum effect ".0016); corrections to c and c' were derived from all 35 clusters stars; and the final m_x and m_y for each pair were converted into seconds of arc per year (1 mm = 20".75).

The resulting motions are given in Table IV. The 5 stars whose motions differ more than 0".010 from the group motion are given at the bottom of the table.

Next, for each star the residuals δ of the individual motions were formed from the mean of four. The $\Sigma\delta^2$ for the four pairs in each co-ordinate are given in Table V.

TABLE V

$\Sigma\delta^2$ FOR DIFFERENT PAIRS

Unit = (0".001)^2

Pair	X	Y
I	114.05	168.15
II	218.32	182.27
III	203.16	185.80
IV	111.72	146.83
Sum	647.25	683.05

There is no appreciable difference in the accuracy between the X and Y co-ordinates.

The probable error of a proper motion based on one pair of plate-groups is given by

$$0.6745\sqrt{\frac{1330.30}{320-80}} = 1.586\,, \qquad \text{or} \qquad 0".001586\,;$$

that of the mean of four pairs is 0".00079. The probable error of the latter value is

$$\frac{0.477}{\sqrt{320}} \times ''.00079 = 0''.000021 .$$

INTERNAL MOTIONS

For the 35 stars considered as belonging to the cluster we find:

$$\sum(\mu_x)^2 = 89.30 , \qquad \sum(\mu_y)^2 = 85.28 ;$$

there is no appreciable difference between x and y. Assuming a Gaussian distribution for μ_x and μ_y with respect to the "true" group motion, we derive the following probable values of the observed relative internal motion in either co-ordinate:

$$0.6745\sqrt{\frac{174.58}{70-2}} = 1.081 , \qquad \text{or} \qquad 0''.00108 \pm 0''.00006 .$$

Table VI shows the agreement between the number of observed internal motions, within certain limits, and that computed according to a Gaussian law with probable error 0".00108. The agreement is satisfactory.

TABLE VI

NUMBER OF OBSERVED INTERNAL MOTIONS
Unit = 0".001

Limits of μ_x and μ_y	Observed	Computed P.E. 1.08
0.0–0.5	22	17.2
0.6–1.0	12	15.5
1.1–1.5	11	12.8
1.6–2.0	12	9.7
2.1–2.5	8	6.5
2.6–3.0	1	4.0
3.1–3.5	1	2.3
3.6–4.0	2	1.2
4.1–4.5	0	0.5
4.6–5.0	1	0.1
5.1–∞	0	0.2
All	70	70.0

Correcting for the probable error 0".00079, a value of 0".00073 ± ".00009 is found for the probable value of the internal motion.

Any deviation from a magnitude error varying linearly with magnitude and any errors in the magnitudes and plate constants may have introduced systematic errors in the motions which would not completely cancel out in taking the mean of four. The effect has probably been very small, but it would mean that the internal motion just derived is an upper limit. Parenthetically, any systematic internal motion of the nature of an expansion or rotation is eliminated by the method employed in reducing the plates.

An attempt to find individual stars with appreciable motions may be made. Table VII gives the expected number of observed motions over certain limits, assuming these motions to be due to observational errors only.

TABLE VII

NUMBER OF OBSERVED INTERNAL MOTIONS
Unit = 0".001

Limits of μ_x and μ_y	Observed	Computed P.E. 0.79
0.0–1.0	34	42.3
1.1–2.0	24	21.5
2.1–3.0	9	5.5
3.1–4.0	2	0.7
4.1–5.0	1	0.0

From this we may conclude that star 224 seems to have an appreciable internal motion in X.

The mean internal motion derived in this paper is of the same size as that recently derived by Hertzsprung[4] for the Pleiades, viz., a probable value of 0".00073.

The present value of the internal motion is in harmony with the expected perspective and dynamical effects; the former would cause internal motions up to 0".003, the latter values averaging less than 0".001.

LEANDER MCCORMICK OBSERVATORY
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[4] *Ibid.*, **7**, 187, 1934.